Vol. 900 Number 3

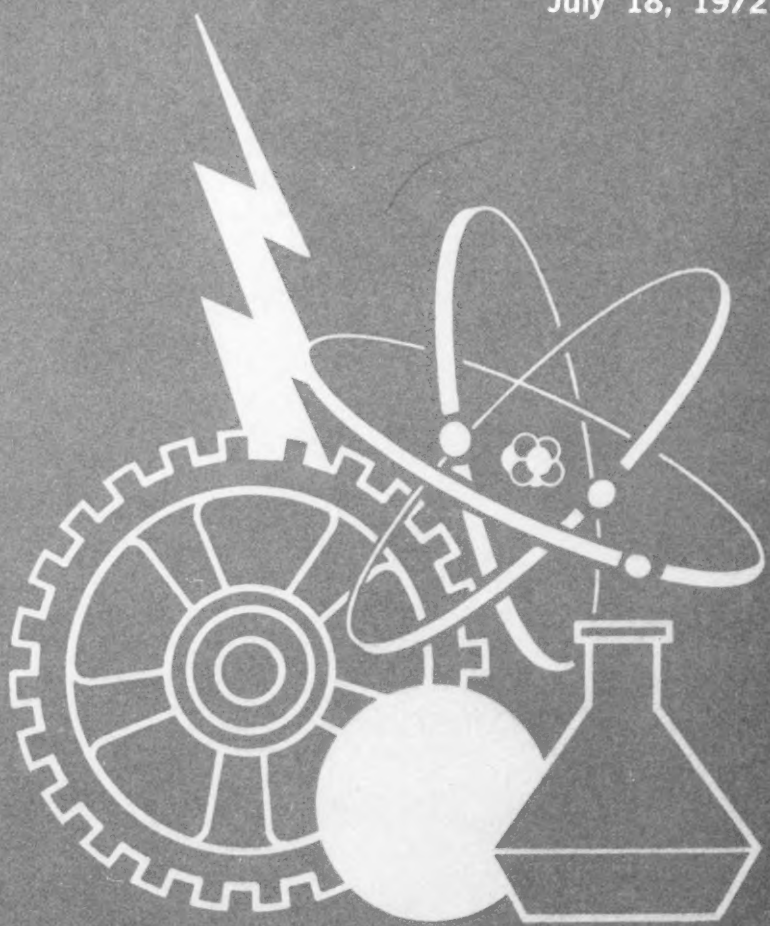
OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

July 18, 1972



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

July 18, 1972 Volume 900 Number 3

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PATENT OFFICE NOTICES

Certificates of Correction for the Week of July 18, 1972

Re. 27,308	3,619,283	3,635,534	3,645,378
3,438,868	3,619,506	3,635,640	3,645,719
3,513,162	3,619,618	3,635,651	3,645,795
3,514,446	3,619,736	3,635,692	3,645,895
3,523,943	3,620,055	3,635,998	3,645,925
3,525,739	3,620,980	3,636,014	3,645,931
3,525,740	3,621,226	3,636,326	3,645,996
3,538,131	3,621,243	3,636,350	3,646,120
3,544,549	3,621,365	3,636,408	3,646,328
3,554,921	3,621,765	3,636,540	3,646,337
3,558,535	3,622,317	3,637,571	3,646,360
3,583,974	3,622,530	3,637,601	3,646,390
3,585,678	3,622,903	3,637,842	3,646,555
3,587,606	3,623,636	3,638,753	3,647,160
3,587,925	3,623,721	3,639,048	3,647,476
3,588,363	3,623,929	3,639,141	3,647,505
3,590,036	3,624,188	3,639,199	3,647,683
3,590,193	3,624,419	3,639,245	3,647,967
3,592,026	3,624,490	3,639,347	3,649,427
3,592,281	3,624,547	3,639,398	3,649,457
3,592,930	3,624,557	3,639,428	3,649,477
3,595,619	3,624,776	3,639,540	3,649,492
3,597,468	3,624,783	3,640,330	3,649,715
3,598,782	3,625,867	3,640,609	3,649,731
3,598,808	3,625,912	3,641,055	3,650,115
3,600,071	3,626,028	3,641,068	3,650,413
3,600,350	3,626,046	3,641,072	3,650,454
3,600,373	3,626,166	3,641,116	3,650,457
3,600,415	3,627,196	3,641,134	3,650,460
3,603,104	3,627,629	3,641,202	3,650,479
3,603,827	3,627,720	3,641,419	3,650,555
3,605,220	3,628,435	3,641,793	3,650,646
3,607,298	3,628,899	3,641,835	3,650,696
3,607,382	3,629,104	3,641,919	3,650,703
3,607,534	3,629,185	3,642,448	3,650,911
3,607,877	3,629,299	3,642,463	3,651,061
3,608,254	3,629,455	3,642,577	3,651,221
3,608,676	3,629,562	3,642,674	3,651,400
3,608,680	3,629,851	3,642,689	3,651,468
3,609,292	3,630,205	3,642,749	3,651,499
3,610,519	3,630,513	3,642,783	3,651,866
3,610,737	3,631,255	3,642,803	3,652,071
3,610,848	3,631,386	3,642,997	3,652,092
3,611,838	3,631,410	3,643,150	3,652,507
3,614,371	3,631,641	3,643,602	3,652,668
3,614,580	3,631,759	3,643,662	3,652,740
3,615,229	3,631,833	3,643,789	3,653,183
3,615,297	3,632,606	3,644,103	3,653,331
3,615,415	3,632,755	3,644,130	3,653,474
3,615,700	3,632,843	3,644,218	3,653,623
3,616,232	3,632,985	3,644,254	3,653,635
3,616,306	3,632,995	3,644,292	3,653,765
3,616,364	3,633,536	3,644,322	3,653,881
3,617,117	3,634,122	3,644,365	3,653,921
3,617,256	3,634,353	3,644,427	3,654,065
3,617,496	3,634,408	3,644,470	3,654,310
3,618,050	3,634,409	3,644,495	3,654,311
3,618,185	3,634,469	3,644,505	3,654,547
3,618,291	3,634,870	3,644,612	3,655,088
3,619,115	3,635,022	3,645,044	3,655,612
3,619,242	3,635,363	3,645,136	3,655,867

Dedications

3,268,666.—*Martin A. Odom,* Oakland, Calif. CALL DIVERTER TRANSLATORS. Patent dated Aug. 23, 1966. Dedication filed Jan. 3, 1972, by the assignee, *Ford Industries, Inc.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,325,563.—*Bert S. Taylor, New York, N.Y.,* and *Martin R. Lutz,* Arlesheim, Basel-Land, Switzerland. BIS(BROMOHALOPROPYL)BROMOHALOPROPYL PHOSPHONATES AND THE CORRESPONDING POLYPHOSPHONATES. Patent dated June 13, 1967. Dedication filed Jan. 14, 1972, by the assignee, *FMC Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

3,409,741.—*Martin A. Odom,* Oakland, Calif. TELEPHONE CALL DIVERTER CONTROL CIRCUIT. Patent dated Nov. 5, 1968. Dedication filed, Jan. 3, 1972, by the assignee, *Ford Industries, Inc.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,576,911.—*Frank S. Maxey,* Akron, Ohio. SHOE SOLE COMPOUND. Patent dated Apr. 27, 1971. Dedication filed Dec. 20, 1971, by the assignee, *The Goodyear Tire & Rubber Company.*

Hereby dedicates to the People of the United States the entire term of said patent.

3,590,806.—*Joseph K. Locke,* De Kalb, Ill. PORTABLE L.P. GAS SPACE HEATER. Patent dated July 6, 1971. Dedication filed Feb. 4, 1972, by the assignee, *Bernzomatic Corporation.*

Hereby dedicates to the Public the entire term of said patent.

3,590,860.—*Irving H. Stenner,* Brockport, N.Y. PRESSURE REGULATOR VALVE FOR L.P. CARTRIDGES. Patent dated July 6, 1971. Dedication filed Feb. 4, 1972, by the assignee, *Bernzomatic Corporation.*

Hereby dedicates to the Public the entire term of said patent.

Disclaimers

3,515,803.—*Malcolm M. Lorang,* Garden Grove, Calif. CONTRAST RANGE CONTROL. Patent dated June 2, 1970. Disclaimer filed Dec. 13, 1971, by the assignee, *The Magnavox Company.*

Hereby enters this disclaimer to all claims of said patent.

3,576,626.—*Terry W. Milligan,* Belmont, and *Richard W. Young,* Wellesley Hills, Mass. PHOTOGRAPHIC COLOR DIFFUSION TRANSFER PROCESSES AND FILM UNIT FOR USE THEREIN. Patent dated Apr. 27, 1971. Disclaimer filed Mar. 29, 1972, by the assignee, *Polaroid Corporation.*

Hereby enters this disclaimer to the portion of the term of the patent subsequent to Oct. 21, 1986.

3,629,853.—*John D. Newton,* Kingston, N.Y. DATA PROCESSING ELEMENT. Patent dated Dec. 21, 1971. Disclaimer filed Mar. 24, 1972, by the assignee, *International Business Machines Corporation.*

Hereby enters this disclaimer to claims 17, 21, 22, 25, 26, 28 and claim 1 of said patent.

3,630,962. *Christian H. Stapfer,* Newtown, Pa. AZINES AND HYDRAZONES AS PAINT DRIER ACCELERATORS. Patent dated Dec. 28, 1971. Disclaimer filed Feb. 7, 1972, by the assignee, *Cincinnati Milacron Chemicals, Inc.*

Hereby enters this disclaimer to claims 1, 2, 4 and 10 of said patent.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 27, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-18-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocylic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-21-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	4-15-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	4-05-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-01-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	11-02-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-03-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-21-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-23-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	5-05-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts: Household, Personal and Fine Arts.	2-05-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vechicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	6-07-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	6-01-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgary; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	4-12-71
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	6-10-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	4-20-71

Expiration of patents: The patents within the range of numbers indicated below expire during July 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,712,131 to 2,714,206, inclusive
Plant Patents..... Numbers 1,404 to 1,407, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED JULY 18, 1972

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

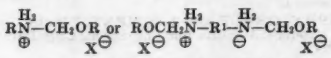
Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T900,001
AMINOMETHYLATING AGENTS AND PROCESSES FOR PREPARING AND USING SAME

Delbert D. Reynolds, Pittsford, and Bernard C. Cossar, Rochester, N.Y. (both of 1669 Lake Ave., Rochester, N.Y. 14615)

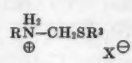
Filed Dec. 21, 1970, Ser. No. 100,298
Int. Cl. C07d *87/00*
U.S. Cl. 260—244 R
No Drawing. 51 Pages Specification

Aminomethylating agents are prepared by the reaction of an N,N',N''-substituted hexahydrotriazine, or a derivative thereof, with hydrogen chloride. The reaction medium is either an inert solvent or an alcohol. When an alcohol is used, the product is an alkoxymethylamine of the structure

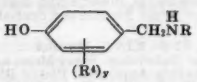


wherein R is alkyl or aralkyl, R^1 is alkylene or arylenebisalkylene and X is an anion. When the reaction is conducted in an inert medium, the product is either a chloromethylamine of the formula $RNHCH_2X$ wherein R and X are the same as previously defined, or the trihydrochloride salt of the N,N',N''-substituted hexahydrotriazine, or a mixture of the two.

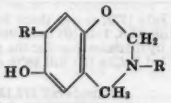
Examples of the reaction of the aminomethylating agents with a compound containing an active hydrogen atom to yield Mannich bases containing secondary amine functions are: the aminomethylation of mercaptans to yield compounds of the formula



wherein R and X are defined above and R^3 is an organo group; the aminomethylation of a phenolic compound to yield p-substituted products of the formula



wherein R is the same as previously described, R^4 is an alkyl aryl, aralkyl, halogen, dialkylamino, or ester group and *y* is 0, 1, 2 or 3; the aminomethylation of hydrogen sulfide under acidic conditions to yield products having the general structure $RNHCH_2SCH_2NHR \cdot 2HX$ wherein R and X are the same as previously described, and the aminomethylation of hydroquinone or 2-substituted hydroquinones to yield monobenzoxazine derivatives of the formula

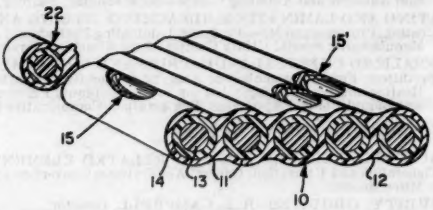


wherein R is as previously described and R^5 is an alkyl or aralkyl group. The cleavage of an aminomethylated thioacid containing a secondary amine group to give a bis(secondary aminomethyl)sulfide hydrochloride is also disclosed.

T900,002
OPTICAL FIBER RIBBON AND METHOD OF MANUFACTURE

Jack Barnett Wielar II, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 8, 1971, Ser. No. 113,563
Int. Cl. G02b *5/16*
U.S. Cl. 350—96 B
1 Sheet Drawing. 10 Pages Specification



Optical fiber ribbons of unitary and substantially planar construction are provided wherein a plurality of polymeric optical filaments are aligned and adhesively secured in side-to-side relationship to provide a non-woven ribbon which may be frustrated at any desired or selected location along its length to provide light emission thereat of any light adapted to be transmitted by said optical filaments of said ribbon.

An especially useful construction employing the optical ribbon comprises several layers of the non-woven fiber ribbon secured together by any suitable means such as adhesives to provide a unitary image guide structure. The layers of the image guide need not be secured together along the entire length thereof, but can be secured together at only the respective ends of the image guide. In all instances, however, each optical ribbon layer of the image guide must be similarly aligned at each end of the image guide in order to properly transmit an image from one end of the image guide to the other.

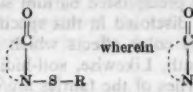
T900,003
METHOD OF IMPROVING RUBBER TO BRASS ADHESION

Robert L. Arnold, Medina, and John P. Vander Kooi, Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

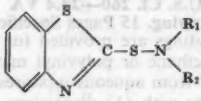
Filed Mar. 5, 1971, Ser. No. 121,563
Int. Cl. B32b *15/06*; C08c *9/04, 11/62*
U.S. Cl. 156—306
No Drawing. 15 Pages Specification

The adhesion of rubber to brass is improved by a method which comprises the addition to the rubber of

sulpenamide-type prevulcanization inhibitors of the formula

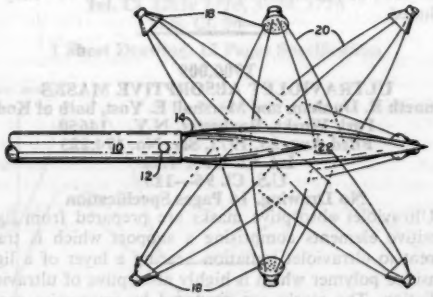


is a radical derived by removal of hydrogen from an imide of a dicarboxylic acid, from a monocarbonyl cyclic urea, and from an imide in which the nitrogen is linked to carbonyl by alkylene and R is alkyl, aryl, or cycloalkyl. The method is applicable to sulfur-vulcanizable rubber stock comprising natural rubber, synthetic cis 1,4-polyisoprene rubber, or rubber blends of about 50% natural rubber or about 50% synthetic cis 1,4-polyisoprene rubber, sulfur as vulcanizing agent and a vulcanization accelerator selected from the group consisting of 2-mercaptobenzothiazole, 2,2'-benzothiazolyldisulfide and 2-benzothiazolesulfenamide of the formula



wherein R_1 is hydrogen or alkyl of 1–8 carbon atoms, R_2 is alkyl of 1–8 carbon atoms or cycloalkyl of 5–8 carbon atoms or R_1 and R_2 with the nitrogen atom form a heterocycle of 4–8 carbon atoms, wherein the sulfur/accelerator ratio is less than 4 and comprises adding an adhesion enhancing amount of the sulfenamide-type prevulcanization inhibitor to the stock, contacting the stock to brass and vulcanizing the composite.

T900,004
SMOKE SUPPRESSOR
William H. Lauderback, 112 W. Edgefield, Longview, Tex. 75601
Filed Mar. 22, 1971, Ser. No. 126,783
Int. Cl. F27b *9/00*
U.S. Cl. 23—2 C
1 Sheet Drawing. 9 Pages Specification



Method and apparatus for eliminating visible by-products occurring during open-air burning of combustible materials such as gaseous hydrocarbons in a flare wherein the flame is contacted with a water spray in the form of a fog or fine droplets which envelopes the flame. The amount of water used depends upon factors such as the size of the flare, the amount of material burned, the composition of the material burned and the configuration of the spray heads. The minimum water requirement is that necessary to produce a completely enveloping fog or mist and the maximum is less than that much would extinguish the flame.

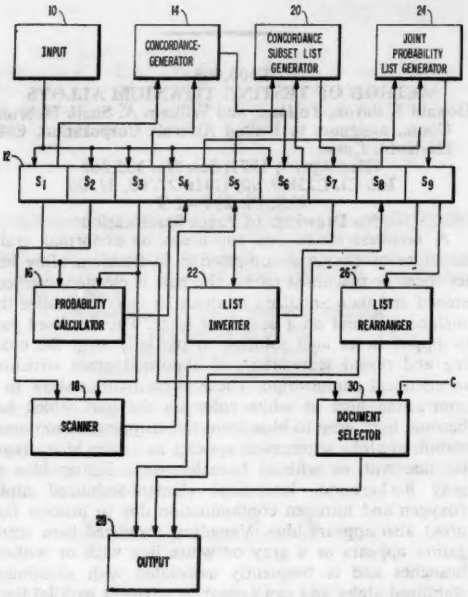
T900,005
METHOD OF TESTING TITANIUM ALLOYS
Donald J. Baron, Tolland, and William A. Snell, Hebron, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Apr. 7, 1971, Ser. No. 132,208
Int. Cl. C23b *9/00*; G01n *27/00, 31/00*
U.S. Cl. 204—1 T
No Drawing. 14 Pages Specification

A non-destructive test for areas of abnormal grain structure or chemical composition in titanium alloy billet slices or machined parts. The part is cleaned, washed, etched and then anodized at about 30 volts to oxidize the surface and coat on a deep blue layer. The anodized part is dipped in an acid solution to partially strip the coating and reveal segregation of abnormal grain structure or chemical composition. These abnormalities show in a contrasting blue or white color on the part which has become light gray to blue from the stripping. Aluminum-stabilized alpha segregation appears as a deep blue irregular line with or without branches on a lighter blue to gray background. Interstitial element-stabilized alpha (oxygen and nitrogen contamination due to process failures) also appears blue. Vanadium-stabilized beta segregation appears as a gray or white line with or without branches and is frequently associated with aluminum-stabilized alpha and can appear as adjacent parallel lines. Chemically pure titanium also appears light gray or white. Differentiation between the interstitial element-stabilized alpha an the aluminum-stabilized alpha and between the pure titanium and the vanadium-stabilized beta segregation can be accomplished by metallographic techniques employing surface replication methods.

T900,006
INFORMATION STORAGE AND RETRIEVAL SYSTEM AND METHOD
Matthews P. Perriens, Rockville, Md., and John H. Williams, Jr., Annandale, Va., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of application Ser. No. 736,837, June 13, 1968. This application Apr. 19, 1971, Ser. No. 135,467
Int. Cl. G06f *1/00, 7/00, 15/00*
U.S. Cl. 340—172.5
3 Sheets Drawing. 21 Pages Specification

An information storage and retrieval system and method capable of handling queries in sentence form and presenting responses either as identification numbers of potentially pertinent documents or as documents in full text form. Stored documents containing so-called search symbols are known to the system. A probability calculator determines the likelihood of the occurrence of a search symbol at least once in a given stored document in the system's data base. The system and method causes the query text to be scanned so as to determine which search symbols are contained therein. The term overlap is used to designate a search symbol in the query and also in a given stored document. The particular document in the system's data base having the smallest joint probability of occurrence of overlap search symbols is designated as having the highest relevance potential within the data base to a given query. The stored document having the next larger joint probability of occurrence of overlap search symbols, has the next highest relevance potential. In this manner, any select number of relevant stored

documents may be outputted by the system and method, in the order of relevance, as either identification numbers of potentially pertinent documents or as the documents per se in full text form.



T900,007
ACID MODIFIED POLYESTER FIBERS DYED WITH BASIC DYESTUFFS

Richard D. Neal, 504–D Manor Drive, Kingsport, Tenn. 37660

Filed May 12, 1971, Ser. No. 142,817
Int. Cl. D06p *5/00*
U.S. Cl. 8—168
No Drawing. 16 Pages Specification

Disclosed are polyester textile fibers having dispersed therein a specific type of precipitated barium sulfate, the barium sulfate having an average particle size of about 0.8 micron. The fibers disclosed are characterized by improved dyeability with disperse dyes and soil-hiding properties. Also disclosed are yarns and fabrics containing the novel fibers of this invention in blends or as plied yarns. The particular polyester fibers utilized in the blends and plied yarns are: poly(1,4-cyclohexylene dimethylene terephthalate) containing 5% poly(oxyethylene glycol) of about 1500 molecular weight; poly(1,4-cyclohexylene dimethylene terephthalate) containing 5% poly(oxyethylene glycol) of about 1500 molecular weight and about 2.8% precipitated barium sulfate; poly(1,4-cyclohexylene dimethylene terephthalate); poly(1,4-cyclohexylene dimethylene terephthalate) containing precipitated barium sulfate; poly(ethylene terephthalate) modified with 5(4-sodiosulfophenoxy)isophthalic acid incorporated in the polymer chain in an amount sufficient to impart basic dyeability thereto; poly(ethylene terephthalate) modified with 5(4-sodiosulfophenoxy) isophthalic acid incorporated in the polymer chain in an amount sufficient to impart basic dyeability thereto and containing precipitated barium sulfate; poly(ethylene terephthalate) heat set at 180° C.; and poly(ethylene terephthalate) heat set at 180° C. and containing precipitated barium sulfate. The novel yarns and fabrics disclosed in this specification are characterized by novel color effects which can be obtained in a single dye bath. Likewise, soil-hiding and apparent cleanability properties of the fabrics are enhanced as well as the desirable color combination obtained.

T900,008
PROCESS FOR TREATING SHEET MATERIALS WITH ANIONIC AQUEOUS POLYURETHANE DISPERSIONS

Gerhard Ballé, Cologne, Wolfgang Keberle and Karlheinz Kowalewski, Leverkusen, and Bruno Zorn, Cologne, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 11, 1971, Ser. No. 170,961
Claims priority, application Germany, Aug. 21, 1970, P 20 41 550.3
Int. Cl. C08d *9/10*; C08g *37/32*
U.S. Cl. 260—29.4 VA
No Drawing. 15 Pages Specification

Heat cured coatings are provided for leather and microporous polyurethane or polyvinyl material. The coatings are prepared from aqueous mixtures of tri- to hexamethylol melamine with (1) dispersions of anionic polyurethanes, with (2) mixtures of dispersions of anionic polyurethanes with vinyl latexes, or with (3) dispersions of graft copolymers of ethylenic monomers with the anionic polyurethanes. The anionic polyurethanes are preferably emulsifier-free aqueous dispersions of polyurethanes having 0.1 to 3% by weight of sulfonate and/or carboxylate groups introduced by combining an alkali salt of taurine, methyltaurine, 6-aminocaproic acid, glycine, sulfanilic acid, diaminobenzoic acid, ornithine or lysine, or addition products of sultones with diamines, with isocyanate group-containing prepolymers prior to or simultaneously with dispersion in water. The graft copolymers are prepared by introducing monomers into the anionic polyurethane dispersion under free-radical polymerization conditions. Monomers include the free acids, esters and amides of such unsaturated acids as acrylates and maleates, their methylol amides, and the nitrile monomers, vinyl esters, ethers, ketones, and amides, hydrocarbons as styrenes, mono and diolefins, etc. Anionic or nonionic emulsifiers other than the anionic polyurethane may optionally be used. Acid catalyst and modifiers such as pigments, dyes and stabilizers, etc. may be included.

T900,009
ULTRAVIOLET ABSORPTIVE MASKS

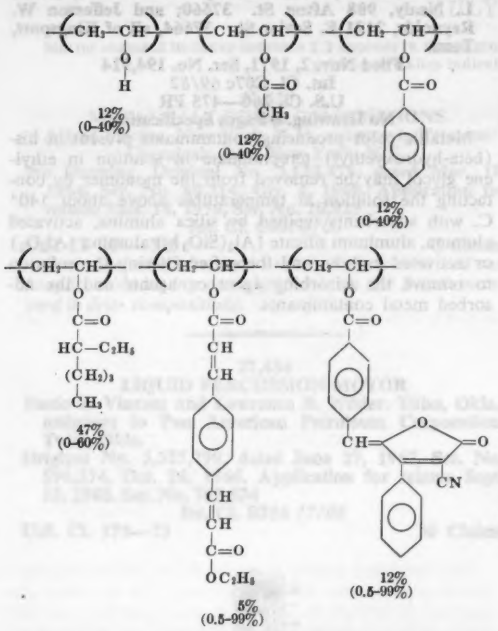
Kenneth R. Dunham and Marshall E. Yost, both of Kodak Park Works, Rochester, N.Y. 14650

Filed Aug. 23, 1971, Ser. No. 174,223
Int. Cl. G03c *1/68*
U.S. Cl. 96—115
No Drawing. 14 Pages Specification

Ultraviolet absorptive masks are prepared from light-sensitive elements comprising a support which is transparent to ultraviolet radiation bearing a layer of a light-sensitive polymer which is highly absorptive of ultraviolet radiation. The masks are prepared by imagewise exposing the element to actinic radiation to insolubilize polymer in the exposed areas and developing an ultraviolet absorptive image by removing polymer from the unexposed areas. These masks are employed in the preparation of photoresist images in the same manner as silver halide masks are employed in this art.

Useful polymers include those which have appended to the polymer backbone a moiety derived from a p-(2,5-dihydro - 3 - cyano-2-oxo-4-phenyl - 5 - furylidenemethyl)

benzoic acid or benzoyl chloride and a moiety derived from either a p-(2-ethoxycarbonylvinyl)cinnamic acid or cinnamoyl chloride or a p-(2-ethylhexyloxycarbonylvinyl) cinnamic acid or cinnamoyl chloride. Particularly preferred are polymers having the structural formula



In this structure the preferred mole ratio of the various repeating units is shown directly below the corresponding units and the preferred range for the repeating units is shown therebelow in parentheses.

T900,010

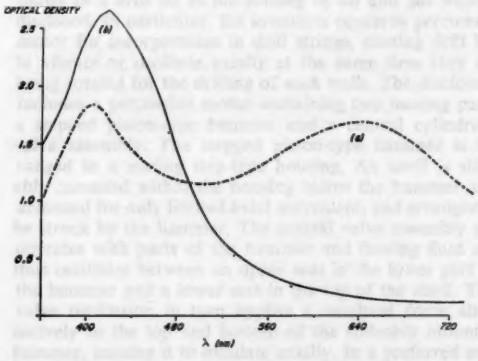
BLUE COLLOIDAL SILVER IMAGING SYSTEM

David Clayton Shuman, Kodak Park, Rochester, N.Y. 14650

Filed Sept. 10, 1971, Ser. No. 179,388

Int. Cl. G03c *1/16, 5/24, 5/26*
U.S. Cl. 96—50

1 Sheet Drawing. 12 Pages Specification



Blue colloidal silver having an average diameter range from about 50 A. to about 300 A. is prepared by physical development of silver nuclei having an average diameter of about 10 A. to about 200 A. coated on a support. An image may be obtained in the blue silver by contacting it with halide ions which causes the blue silver to recrystallize to a yellow form. Contacting a slightly moistened finger against blue silver with light pressure results in a fingerprint of excellent quality in the form of yellow silver. Halide ions may be transferred from an exposed and developed silver halide layer with recrystallization of the blue silver occurring in the area that corresponds to the exposed and developed silver halide. The resulting image can be stabilized by contacting with a phenyl mercapto tetrazole solution.

T900,011

SENSITIZERS FOR LIGHT SENSITIVE POLYMER COMPOSITIONS

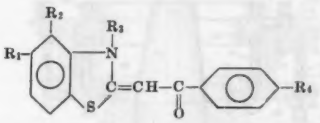
Melvin S. Bloom and Alfredo R. Guevara, both of Kodak Park Works, Rochester, N.Y. 14650

Filed Sept. 13, 1971, Ser. No. 180,196

Int. Cl. G03c *1/68*
U.S. Cl. 96—115

No Drawing. 10 Pages Specification

Light sensitive polymer compositions containing photocrosslinkable polymers, such as polymers containing the diphenylcyclopropene carboxylate moiety, can be sensitized with sensitizers having the following structural formula



wherein

R_1 is halo, particularly chloro,

R_2 is hydrogen or, taken together with R_1 represents the atoms necessary to complete a fused benzene ring,

R_3 is lower alkyl having 1 to 4 carbon atoms, particularly ethyl,

R_4 is an electronegative substituent, particularly cyano or trifluoromethyl.

Representative sensitizers include 2-(p-cyanobenzoylmethylene)-3-ethylnaphtho[1,2-d]thiazoline, 3-ethyl-2-[p-(trifluoromethyl)benzoylmethylene]-naphtho[1,2 - d]thiazoline and 5-chloro-2-(p-cyanobenzoylmethylene)-3-ethylbenzothiazole.

T900,012

PHOTOGRAPHIC DIFFUSION TRANSFER ELEMENTS, FILM UNITS, AND METHODS FOR PROCESSING SAME

John V. Williams, Pittsford. N.Y. (Rochester, N.Y. 14650)

Filed Oct. 4, 1971, Ser. No. 186,395

Int. Cl. G03c *1/40*
U.S. Cl. 96—77

No Drawing. 15 Pages Specification

Photosensitive elements are described comprising:

(a) a nuclei layer containing physical development nuclei and a nondiffusible coupler capable of reacting with oxidized aromatic primary amino color developing agent to produce a diffusible dye, the nuclei layer being free of any silver salt; and

(b) a photosensitive silver halide emulsion layer containing a development inhibitor-releasing compound capable of reacting with oxidized color developing agent to release a diffusible development inhibitor.

The photosensitive element is processed with an alkaline processing composition in the presence of a color developing agent and a silver halide solvent. Upon development, the color developing agent becomes oxidized and reacts with the development inhibitor-releasing compound, preferably a coupler to release a diffusible development inhibitor imagewise. The remaining silver halide in the emulsion layer corresponding to unexposed and thus undeveloped areas forms a soluble silver ion complex with the silver halide solvent present. The complex migrates to the nuclei layer where it is then physically developed causing the developing agent to become oxidized. The oxidized developing agent then reacts with the nondiffusible coupler to form an imagewise distribution of diffusible dye which transfers to a dye image-receiving layer to provide a positive dye image.

T900,013

PROCESS FOR REMOVING METALLIC COLOR PRODUCING CONTAMINANTS FROM SOLUTIONS OF BIS(BETA-HYDROXYETHYL) TEREPHTHALATE IN ETHYLENE GLYCOL

Thomas G. Davis, 1542 Waverly Road 37664; David L. Nealy, 908 Afton St. 37660; and Jefferson W. Reynolds, 2121 E. Sevier St. 37664, all of Kingsport, Tenn.

Filed Nov. 2, 1971, Ser. No. 194,914
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 PR
No Drawing. 8 Pages Specification

Metallic color producing contaminants present in bis-(beta-hydroxyethyl) terephthalate in solution in ethylene glycol may be removed from the monomer by contacting the solution at temperatures above about 140° C. with adsorbents typified by silica alumina, activated alumina, aluminum silicate [$Al_2(SiO_3)_3$] alumina (Al_2O_3) or activated carbon, and thereafter filtering the solution to remove the adsorbing agent or agents and the adsorbed metal contaminants.

REISSUES

JULY 18, 1972

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,433
METAL SALT DRIER COMPOSITIONS

Alfred Fischer, New York, N.Y., assignor to Tenneco Chemicals, Inc., New York, N.Y.

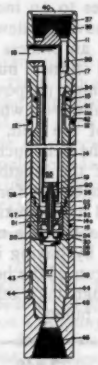
No Drawing. Original No. 3,124,475, dated Mar. 10, 1964, Ser. No. 60,314, Oct. 4, 1960. Application for reissue Mar. 18, 1970, Ser. No. 20,825
Int. Cl. C09f *9/00*
U.S. Cl. 106—310 3 Claims

Basic lead salts of certain branched chain saturated carboxylic acids having no substituents on the 2-carbon are used in drier compositions.

27,434
LIQUID PERCUSSION MOTOR

Renic P. Vincent and Lawrence B. Wilder, Tulsa, Okla., assignors to Pan American Petroleum Corporation, Tulsa, Okla.

Original No. 3,327,790, dated June 27, 1967, Ser. No. 596,374, Oct. 24, 1966. Application for reissue Sept. 13, 1968, Ser. No. 767,534
Int. Cl. B25d *17/06*
U.S. Cl. 173—73 30 Claims

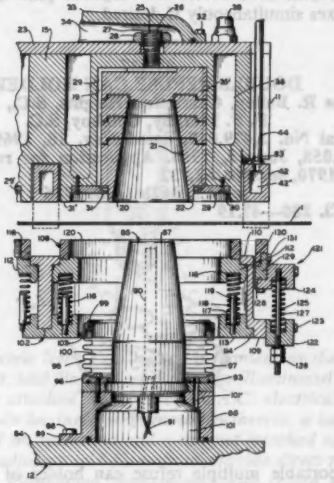


A fluid actuated tool for applying repeated precussive blows to a drill bit in the drilling of oil and gas wells is disclosed. In particular, the invention concerns percussion motor for incorporation in drill strings, causing drill bits to vibrate or oscillate axially at the same time they are being rotated for the drilling of such wells. The disclosure includes a percussion motor containing two moving parts, a stepped piston-type hammer and a central cylindrical valve assembly. The stepped piston-type hammer is arranged in a mating step-type housing. An anvil is slideably mounted within the housing below the hammer and arranged for only limited axial movement, and arranged to be struck by the hammer. The central valve assembly cooperates with parts of the hammer and flowing fluid and thus oscillates between an upper seat in the lower part of the hammer and a lower seat in the top of the anvil. This valve oscillation in turn applies a resultant force alternatively to the top and bottom of the slideably mounted hammer, causing it to oscillate axially. In a preferred embodiment, means are provided to dampen the upper end of the valve motion. Various embodiments of the invention are described.

27,435
MOLDING MACHINES

Richard K. Shelby, Chicago, Ill., assignor to Monsanto Company, St. Louis, Mo.

Original No. 3,341,895, dated Sept. 19, 1967, Ser. No. 534,442, Mar. 15, 1966, which is a continuation-in-part of Ser. No. 333,440, Dec. 26, 1963. Application for reissue Nov. 4, 1970, Ser. No. 87,022
Int. Cl. B29c *17/04*
U.S. Cl. 425—167 17 Claims



A molding machine having cooperating shiftable lower and upper die frames, the upper having cavities and lower having plug assists for urging a thermoplastic web into the cavities by the plug assists responsive to shifting of the frames. A water cooled stripping plate is shiftable on the underside of the upper frame and strips the web from the upper frame. A web clamping frame is shiftable with respect to the lower frame and has an individual clamping ring around each plug assist and a peripheral clamping rim for engaging the web. A pressure applicator is also disposed around each plug assist enabling positive pressure injection around the plug assist. A vacuum is created around the inside of each of the cavities. A vacuum is created between the upper die frame assembly and the web when the clamping frame is shifted upwardly.

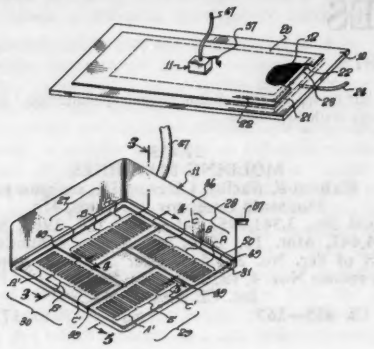
27,436
MAGNETIC POSITIONING DEVICE

Bruce A. Sawyer, 20120 Allentown Drive, Woodland Hills, Calif. 91364

Original No. 3,376,578, dated Apr. 2, 1968, Ser. No. 554,181, May 31, 1966. Application for reissue Mar. 27, 1970, Ser. No. 24,060
Int. Cl. G01d *9/40*
U.S. Cl. 346—29 59 Claims

A two-axis magnetic system for driving chart plotters and other devices. A marker carrying head floated on an air bearing over a platen with no mechanical inter-

connections. A plurality of electromagnets in the head and means for selectively energizing the electromagnets



to move the head across the magnetic platen, and along both axes simultaneouly if desired.

27,437

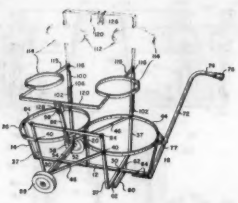
DOUBLE REFUSE CAN HOLDER

Charles R. Bailey, Charleston Heights, S.C., assignor to F. F. Murphy, Cainhoy, S.C.

Original No. 3,479,047, dated Nov. 18, 1969, Ser. No. 734,058, June 3, 1968. Application for reissue Aug. 10, 1970, Ser. No. 62,732

Int. Cl. B62b *1/18, 1/26*

U.S. Cl. 280—47.19 **11 Claims**



A portable multiple refuse can holder of a generally wheelbarrow-like construction and having transversely hinged refuse can cover securing means latchable to prevent access by animals and accidental spillage of the contents of the refuse cans while transporting the cans by means of the holder.

27,438

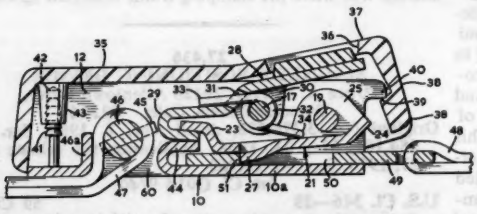
BUCKLE FOR A SAFETY BELT

Frederick H. Humphrey, Markham, Ontario, Canada, assignor to Daal Specialties Limited, Windsor, Ontario, Canada

Original No. 3,270,388, dated Sept. 6, 1966, Ser. No. 465,976, June 22, 1965. Application for reissue Mar. 20, 1968, Ser. No. 719,793

Int. Cl. A44b *11/26*

U.S. Cl. 24—230 A **24 Claims**



A buckle for a belt, including a first pivotally mounted lever member adapted to engage a tongue of a belt, biasing means for urging the first lever member in the direction of engagement of the tongue, a second pivotally mounted lever member coupled to the first lever member, and a cap member positioned over the first and second lever members and having an opening therein through which the second lever member is accessible so that the second lever member may be selectively pivoted to disengage the first lever member from the tongue.

27,439

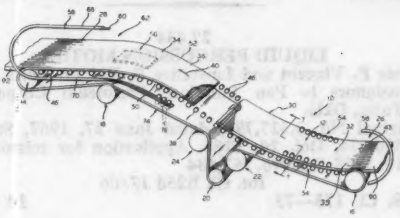
INCLINED MOVING WALKWAY ARRANGEMENT

Randolph H. Jackson, Evanston, Ill., Byron J. Eddy, North Olmsted, Kenneth D. Mitchell, Copley, Ernest D. Johnson, Tallmadge, and Charles G. Hall, Akron, Ohio, and James E. Hicks, Lake Geneva, Wis., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Original No. 3,414,108, dated Dec. 3, 1968, Ser. No. 626,003, Mar. 27, 1967. Application for reissue Sept. 25, 1970, Ser. No. 26,979

Int. Cl. B66b *9/12*

U.S. Cl. 198—16 **21 Claims**



This invention relates to an inclined moving walkway arrangement of the moving sidewalk type in which the walkway is defined by an endless conveyor belt member that is built for lateral stiffness but adequate longitudinal flexibility for belt training purposes, with the belt being trained between end pulleys on wheel-like rollers that support the side edges of the belt, with no solid support through the center of the belt, such as a slider plate, being employed for most of the length of the conveyor. The moving walkway arrangement for the first time provides both a level entry and a level exit that is defined by the belt training arrangement, and a moving hand rail is provided which is driven by having its lower run releasably clamped to the lower run of the belt instead of having the hand rail driven through take off mechanisms from the conveyor driving end pulley.

27,440

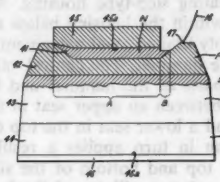
SEMICONDUCTOR RECTIFIER WITH IMPROVED TURN-ON AND TURN-OFF CHARACTERISTICS

Angelo L. De Cecco, Newtown Square, Dante E. Piccone, Philadelphia, and Istvan Somos, Lansdowne, Pa., assignors to General Electric Company

Original No. 3,408,545, dated Oct. 29, 1968, Ser. No. 514,734, Oct. 22, 1965, which is a continuation-in-part of Ser. No. 385,323, July 27, 1964. Application for reissue Oct. 27, 1970, Ser. No. 84,550

Int. Cl. H01l *9/12*

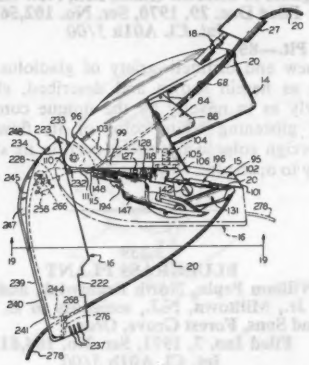
U.S. Cl. 317—235 **26 Claims**



The switching capabilities of a 4-layer broad area PNPN semiconductor device are dramatically improved

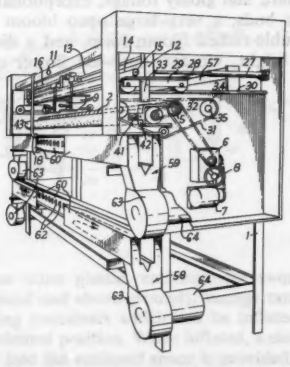
by providing an electrode-less auxiliary region in one of the end layers in the vicinity of the small area where conduction begins, and by constructing and arranging the auxiliary region so that load current initially traversing it acts as a high-current peremptory trigger signal for the laterally-adjacent main region of broader area.

27,441
TYING IMPLEMENT AND METHOD
Stephen A. Crosby, 815 Shore Drive, P.O. Box 736, Twin Lakes, Wis. 53181
Original No. 3,415,557, dated Dec. 10, 1968, Ser. No. 555,590, June 6, 1966. Application for reissue Dec. 10, 1970, Ser. No. 97,056
Int. Cl. D04g *5/00*
U.S. Cl. 289—1.5 **47 Claims**



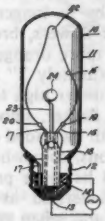
A hand held and manipulated cord or twine tying implement containing a tying bill and guides immovably held on the interior of the implement and through which the cord or twine is fed, the parts of the implement on its interior being capable of directing the twine to tie a weaver's knot as the implement is moved longitudinally along the tensioned twine or cord, such as when the cord extends about a package.

27,442
LAUNDRY FEEDING MACHINE
Henry John Weir, Sedbury, England, assignor to McGraw-Edison Company, Elgin, Ill.
Original No. 3,421,756, dated Jan. 14, 1969, Ser. No. 550,439, May 16, 1966. Application for reissue May 28, 1970, Ser. No. 41,655
Int. Cl. D06f *67/04*
U.S. Cl. 38—143 **25 Claims**



A laundry flatwork feeding machine comprising a conveyor having an upper run which moves in a forward direction, a pair of clamps adapted to grip the two corners for moving the clamps apart transversely and holding them apart under tension in the leading edge whereby the flatwork article is stretched laterally, means coupled with the conveyor for advancing the clamps thereon held apart over the upper run of the conveyor at the same speed and means for opening the clamps to drop the leading edge on the conveyor whereby rucking of said leading edge is prevented.

27,443
ELECTRIC LIGHT BULB WITH OSCILLATING FILAMENT
Robert J. Kyp, 526 Geneva Road, Glen Ellyn, Ill. 60137
Original No. 3,237,053, dated Feb. 22, 1966, Ser. No. 346,481, Feb. 21, 1964. Application for reissue Jan. 29, 1971, Ser. No. 111,161
Int. Cl. H05b *41/16, 41/24*
U.S. Cl. 315—267 **3 Claims**



2. An electric light bulb having a filament as the only movable part, said filament adapted to be illuminated when said bulb is attached to a source of A.C. electrical current, said bulb having a stem mounted therein, a support pin mounted on said stem and a magnet attached to said support pin adjacent said filament to provide direct movement of the illuminated filament and with return movement set up by the A.C. electrical current to maintain continuing vibration of the illuminated filament simulating a flickering flame of a candle, said filament consisting essentially of a single loop with all portions thereof spaced from said magnet and said pin, at least a substantial portion of said filament lying generally in a plane, said magnet having a major axis disposed generally normal to said plane, and said plane intersecting said magnet.

27,444
PROCESS FOR THE PRODUCTION OF POROUS PLASTICS AND PRODUCTS
Guenther Will, Zimmerstrasse 11, Darmstadt, Germany
No Drawing. Original No. 3,256,219, dated June 14, 1966, Ser. No. 301,920, Aug. 13, 1963, which is a continuation-in-part of Ser. No. 45,786, July 28, 1960. Application for reissue Sept. 11, 1970, Ser. No. 71,347
Claims priority, application Germany, July 28, 1959, W 26,093
Int. Cl. C08f *45/24, 47/08*
U.S. Cl. 260—2.5 R **46 Claims**

Production of useful shaped articles, formed of porous plastic, by emulsifying droplets of an aqueous medium in an organic liquid containing polymerizable organic compounds(s) and emulsifying agent(s) and, without breaking the dispersed nature of the emulsion, polymerizing it until the organic liquid has been converted to solid form.

PLANT PATENTS

GRANTED JULY 18, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,236
CHRYSANTHEMUM PLANT

Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 30, 1970, Ser. No. 93,922
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—79 1 Claim

1. A new and distinct cultivar of chrysanthemum characterized generally by its unique bronze color and its capability of being grown either as a standard cut flower or as a pot mum, and characterized particularly as to uniqueness when grown as a standard and when compared with the cultivar Detroit News by its longer peirod of value, approximately ¼" larger flowers, broader, flatter and less tightly incurved petals, more orange bronze color, longer keeping quality, approximately 7" shorter growth habit, greater color retention under high temperature, high light conditions, fading to a darker, smoother, more attractive golden bronze color than the faded color of Detroit News under identical conditions, somewhat lighter colored and less brittle foliage, and its more prominent stipules; and which is further characterized as to uniqueness when grown as a pot mum and when compared with the pot mum Orange Bowl by its one week earlier response, more intense orange bronze flower color, more incurved flower, approximately ¼" larger flower in the opening stage of development but smaller when fully expanded, larger and more deeply indented foliage with less serration of the leaf margin, more prominent stipules, shorter bench life, and its more efficient timing thereby providing a saving in crop time and bench space.

3,237
GLADIOLUS

Cecil C. Marshall, Hamilton, Ontario, Canada, assignor to Selected Glads, Inc., New Albany, Ind.

Filed Dec. 28, 1970, Ser. No. 102,275
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—85 1 Claim

1. A new and distinct variety of gladiolus plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its clear pastel lavender coloring and the production of sound corms year after year.

3,238
GLADIOLUS

Donald J. Walker and Audrey I. Walker, New Hope, Pa., assignors to Selected Glads, Inc., New Albany, Ind.

Filed Dec. 29, 1970, Ser. No. 102,568
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—85 1 Claim

1. A new and distinct variety of gladiolus plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of the pure glistening white color of its flower with no visible foreign color whatsoever, even in its stamens, and the ability to open after shipping dry.

3,239
BLUEGRASS PLANT

Gerard William Pepin, North Brunswick, and Cyril Reed Funk, Jr., Milltown, N.J., assignors to E. F. Burlingham and Sons, Forest Grove, Oreg.

Filed Jan. 7, 1971, Ser. No. 104,819
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—88 1 Claim

A Kentucky bluegrass plant which exhibits a very attractive, rich dark green color, rather prostrate leaf blades and rather large florets and spikelets. The plant produces a high quality turf with a good resistance to leaf spot and rust.

3,240
AZALEA PLANT

Spencer R. Smith, Rockwood, Mich., assignor to Post Gardens, Inc., Rockwood, Mich.

Filed Jan. 28, 1971, Ser. No. 110,675
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—57 1 Claim

1. A new and distinct variety of azalea plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous and upright plant habit, heavy and strong stems, attractive hard and glossy foliage, exceptionally large and long flower buds, a very large open bloom size, an extremely double-ruffled bloom form, and a distinctive and attractive, bright, vibrant, deep-red flower color.

PATENTS

GRANTED JULY 18, 1972

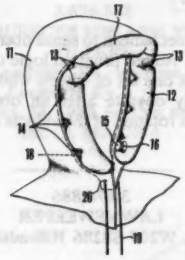
GENERAL AND MECHANICAL

3,676,879

HOOD

Katsumasa Irie, No. 68, Kita Ono-cho, Koyama, Kita-ku, Kyoto, Japan

Filed Aug. 10, 1970, Ser. No. 62,497
Claims priority, application Japan, Aug. 11, 1969, 44/78038
Int. Cl. A42b *1/04*
U.S. Cl. 2—202 **11 Claims**



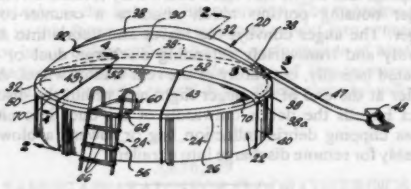
An air tight hood fabricated of flexible materials for use in conjunction with wearing apparal, the marginal exterior of which surrounds the face in a muff-like formation which is capable of maintaining a fixed shape by inflating with air, and preferably having a pronounced, hollow visor portion also fixed in position by inflation.

3,676,880

INFLATABLE ENCLOSURE FOR SWIMMING POOLS AND THE LIKE

John P. Kwake, Los Angeles, Calif., assignor to The Kydar Company, Los Angeles, Calif.

Filed Jan. 28, 1971, Ser. No. 110,573
Int. Cl. E04h *3/18, 3/16*
U.S. Cl. 4—172.12 **19 Claims**



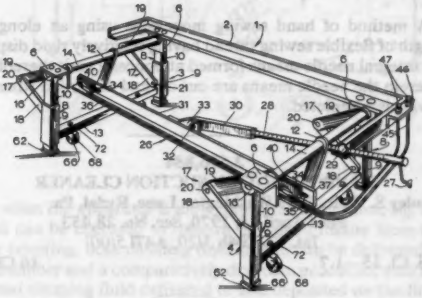
A vinyl, or other plastic, enclosure for swimming pools (both in-ground and above-ground), storage tanks, or other liquid carrying containers which can be inflated by blower means, to a domed position. When inflated, a simplified non-zipper entry into the enclosed space is provided. The enclosure can also be used as a slightly domed or crowned cover to shed rain and dirt.

3,676,881

BED LOCKING DEVICE

Richard H. Duprey, Dayville, Conn., assignor to Interroyal Corporation, New York, N.Y.

Filed May 19, 1970, Ser. No. 38,783
Int. Cl. A61g *7/00*; A47c *19/00*
U.S. Cl. 5—63 **3 Claims**



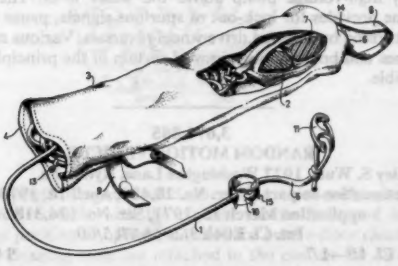
An improved adjustable hospital bed providing Trendelenburg or Fowler selection includes a bed stabilizing device for roller or caster equipped beds having extensible telescoping leg members which may be extended sufficiently to raise the usual casters from the floor resulting in a solid four-point contact instead of the usual caster-roller contact. The extension is provided by the same means used for raising or lowering the bed.

3,676,882

LIFE SAVING IMPLEMENTS

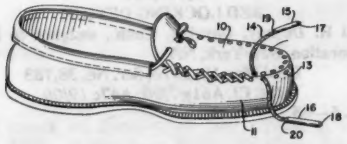
Lars-Hakan Lindqvist, Solstigen 1, Saltsjobaden, Sweden

Filed June 16, 1970, Ser. No. 46,669
Claims priority, application Sweden, June 18, 1969, 8726/69
Int. Cl. B63g *9/26*
U.S. Cl. 9—14 **15 Claims**



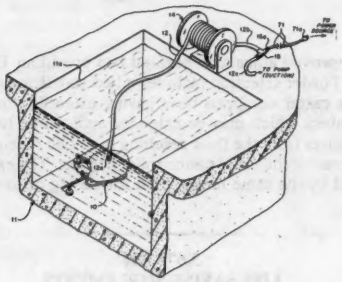
Implement for life saving purposes including a line securely fixed to the bottom of a narrow elongated bag open at one end and containing a weight and being intended to enclose the line and to accompany the line when it is thrown and being adapted to run from the bag, the free end of the line being held, for example, by the thrower.

3,676,883
METHOD OF HAND SEWING MOCCASINS
Ralph W. Peacock, RD2 Bartlett Road, Norwich, N.Y.
Continuation-in-part of Ser. No. 753,611, Aug. 19, 1968, abandoned. This application Nov. 13, 1970, Ser. No. 89,274
Int. Cl. A43d *9/00*
U.S. Cl. 12—142 MC **8 Claims**



A method of hand sewing moccasins using an elongated length of flexible sewing thread having relatively rigid disposable integral needle means formed at opposite ends thereof and wherein the needle means are cut off and discarded when the sewing is completed.

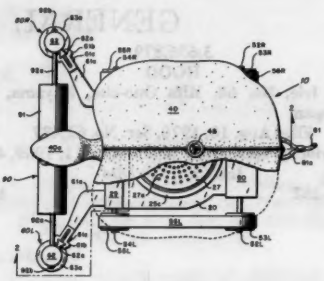
3,676,884
RANDOM MOTION SUCTION CLEANER
Stanley S. Wulc, 1027 Washington Lane, Rydal, Pa.
Filed April 14, 1970, Ser. No. 28,453
Int. Cl. E04h *3/20;* **A47l** *5/00*
U.S. Cl. 15—1.7 **16 Claims**



A self-propelled device adapted to move along the bottom of swimming pools or other water tanks in a random pattern to clean the surface thereof. The cleaner has low-voltage motors for driving, sensing means to sense contact with walls, and electronic logic means to direct the motion of the cleaner according to certain requirements. The Cleaner has a suction inlet, a strainer, and is connected by means of a hose to a relatively high-voltage pump above the water level. The logic means provides for lock-out of spurious signals, pause times, and turning by selected drive wheel reversals. Various modifications and board applications of certain of the principles are possible.

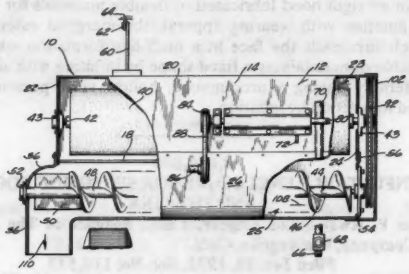
3,676,885
RANDOM MOTION VEHICLE
Stanley S. Wulc, 1027 Washington Lane, Rydal, Pa.
Continuation-in-part of Ser. No. 28,453, April 14, 1970. This application March 15, 1971, Ser. No. 124,318
Int. Cl. E04h *3/20;* **A47l** *5/00*
U.S. Cl. 15—1.7 **9 Claims**

An improved random motion suction cleaner vehicle adapted to translate along and clean the interior bottom surface of a pool or tank in a randomly oriented pattern. The improved cleaner has suction inlet mechanisms, and driving as well as sensing means cooperating with programmed logic means to direct the motion of the vehicle in accordance with pre-programmed instructions. The cleaner includes removeable liquid intake containers to allow ease in cleaning the vehicle when such is necessary. For ease of handling, the improved vehicle incorporates a weight mechanism which is removeably secured to the suction cleaner base cover. A further improvement to the improved vehicle includes the addition of a multi-



directional switch mechanism to sense obstacles in the path of vehicle translation. Added program logic considerations lock the drive control of one set of wheels while allowing another set to continuously operate after an obstacle is impacted thereby leading to a rotation of the vehicle away from the constraining force.

3,676,886
LAWN SWEEPER
Francesco Aiuppa, W207 S8286 Hillendale Drive, Muskego, Wis.
Filed Aug. 5, 1970, Ser. No. 61,075
Int. Cl. E01h *1/04*
U.S. Cl. 15—83 **5 Claims**

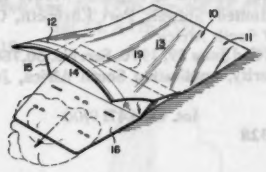


A lawn-sweeping attachment adapted to be supported between the front and rear wheels of a small garden or lawn tractor and under the tractor body, includes a housing which rotatably supports a brush which picks up and discharges grass clippings and debris through a rearwardly located slot into an auger housing portion which contains a counter-rotating auger. The auger conveys the leaves and debris into a rearwardly and transversely extending discharge duct or chute located laterally, outwardly of the rear tractor wheel. An impeller at the end of the auger flight and within the discharge duct impells the debris outwardly of the duct into either a grass clipping debris collection bag or toward a blower assembly for remote discharge into a trailer.

3,676,887
DISPOSABLE LITTER PACKAGE HAVING A SCRAPING BLADE
Stanley R. Klein, 175 W. Ninety-third Street, New York, N.Y.
Filed April 19, 1971, Ser. No. 135,041
Int. Cl. A47l *13/52*
U.S. Cl. 15—104.8 **6 Claims**

A flexible bag body portion has a substantially rigid blade element permanently attached to one side wall thereof adjacent the open mouth of the bag body portion. A flexible clo-

sure flap is carried by the opposite side wall of the bag body portion and has an adhesive sealing area to coact with a like



area on the side wall of the body portion carrying the blade element. The bag is sealed with the litter and the blade element therein prior to disposal.

3,676,888

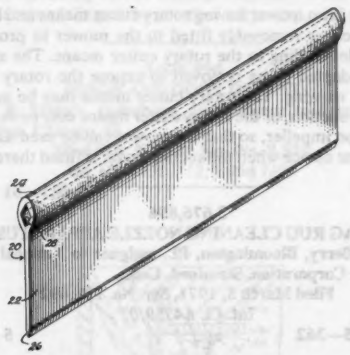
ADJUSTABLE SQUEEGEE FOR APPLYING SYNTHETIC FILLERS

George J. Akers, Louisville, Ky., assignor to Vermont American Corporation, Louisville, Ky.

Filed Oct. 24, 1969, Ser. No. 869,201

Int. Cl. B05c *1/16*

U.S. Cl. 15—245 **6 Claims**



An adjustable squeegee for applying a synthetic filling material, commonly termed "body putty" or "body plastic," to the damaged surfaces of automobile bodies or the like. The squeegee comprises a pliable lower blade portion, and a ductile upper stiffener portion, which can be manually bent into a particular form or shape which it is desired to have the filling material take in the squeegeeing operation. The squeegee will remain in this form until it is manually rebent into a normal form or into a different form for the performance of another squeegeeing operation. The main body of the squeegee is composed of a material to which the filling material will not adhere.

3,676,889

CLEANING APPARATUS FOR FLOOR COVERINGS

William Joel Reginald Edlin, P. O. Box 1321, Palmerston North, New Zealand

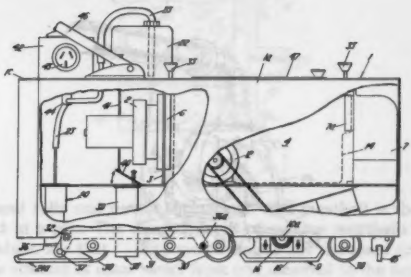
Filed March 2, 1970, Ser. No. 15,796

Claims priority, application Australia, Aug. 4, 1969, 59033; New Zealand, March 6, 1969, 155661

Int. Cl. A47l *11/34*

U.S. Cl. 15—320 **6 Claims**

A cleaning apparatus for floor coverings such as carpets in which a suction creating means such as a fan or fans is supported by a casing and adapted to draw air through an intake orifice. A brush is provided in or within the vicinity of the orifice and is capable of contacting and brushing a floor covering. There is also a chamber adapted to receive cleaning fluid and a large volume of air under pressure, with the cleaning fluid and air forming foam within the chamber. The foam produced in the chamber is delivered through an outlet to the floor covering for cleaning purposes. The arrangement is such



that when the apparatus is moved over the floor covering, the brush can be operated to remove unwanted matter from the floor covering, both cleaning fluid and air can be delivered to the chamber and a comparatively dry foam produced, with the foamed cleaning fluid delivered to and deposited on the floor covering, and the brush moved over the covering to brush the covering and simultaneously the suction means remove loosened dirt from the covering.

3,676,890

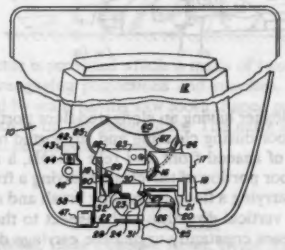
SUCTION CLEANER

Robert F. Dyer, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed March 2, 1970, Ser. No. 15,376

Int. Cl. A47l *9/00*

U.S. Cl. 15—339 **9 Claims**

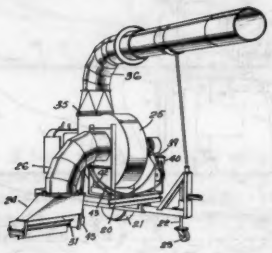


An upright type suction cleaner is provided with a switch actuator movable with the cleaner handle from and to its storage position to operate a switch for on-the-floor cleaning. When cleaning tools are attached to the cleaner for off-the-floor cleaning the switch actuator is movable relative to the handle to effect operation of the switch without movement of the handle. In addition, when the cleaner is upended to effect repairs a gravity-actuated member is actuated to prevent operation of the handle control so that it is impossible to move the handle from its storage position and effect operation of the switch.

3,676,891
VACUUM MACHINE FOR STREET CLEANING

Gregory J. Murray, and Fred K. Tarrant, Jr., both of Saratoga Springs, N.Y., assignors to Tarrant Manufacturing Company, Saratoga Springs, N.Y.

Continuation of Ser. No. 732,948, May 29, 1968, abandoned. This application April 27, 1970, Ser. No. 48,788
Int. Cl. A47l 5/14, 9/04
U.S. Cl. 15—346 6 Claims

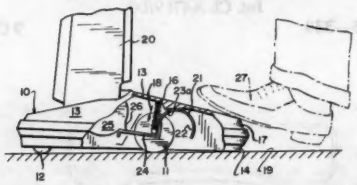


Rotary flinger blades are mounted on a street vacuum cleaner to direct a blast of air beneath matted leaves or other debris on a pavement and to blow the leaves into the inlet of a suction air stream. The blades are mounted to rotate in close proximity to or slightly above or in light contact with the surface of the pavement to be cleaned and are adjustable for height.

3,676,892
VACUUM CLEANER NOZZLE LIFTING DEVICE

Erwin E. Nordeen, St. Paul, Minn., assignor to Whirlpool Corporation

Filed May 19, 1970, Ser. No. 38,804
Int. Cl. A47l 5/34
U.S. Cl. 15—359 5 Claims

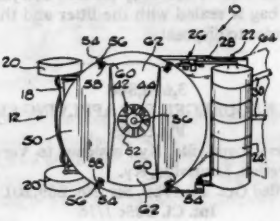


A vacuum cleaner having an elongated floor portion propellable over a floor during cleaning and supported on the floor by a plurality of spaced front and rear wheels, a nozzle unit forming the floor portion of the cleaner having a front suction opening end carrying a floor contacting brush and rockable or pivotable in a vertical direction with respect to the wheels, a first spring means constantly urging the carriage downwardly at the front end to hold the brush in cleaning position with respect to the floor regardless of the nature of the floor or its covering, a propelling handle rockably attached to the cleaner and movable between an operating position and a storage position, second spring means stronger than the first and operably positioned between the front wheels and the front and operably positioned between the front wheels and the front suction end of the nozzle unit and means operated by the handle in moving the handle to the storage position for distorting the second spring means thereby to apply an overcoming spring force to retain the nozzle unit front end away from the floor against the urging of the first spring means. The cleaner can then be operated in the customary off-the-floor cleaning of furniture, draperies and the like by the use of auxiliary equipment without permitting the brush to contact the floor.

3,676,893
ROTARY MOWER

Eric Patrick Greenwood Smythe, Port Elizabeth, Republic of South Africa, assignor to Republic Mower Company (Proprietary) Limited, Sidwell, Port Elizabeth, Cape Province, Republic of South Africa

Filed June 29, 1970, Ser. No. 50,760
Claims priority, application South Africa, July 15, 1969, 69/5015
Int. Cl. A47l 9/00
U.S. Cl. 15—328 1 Claim

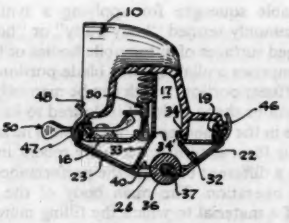


A rotary lawn mower having rotary cutter means and having a suction cover removably fitted to the mower to provide a suction inlet leading to the rotary cutter means. The suction cover is adapted to be removed to expose the rotary cutter means for mowing. The rotary cutter means may be adapted to provide suction, or the rotary cutter means may be replaced by a suction impeller, so that the mower can be used as a suction cleaner device when the suction cover is fitted thereto.

3,676,894
SHAG RUG CLEANING NOZZLE APPARATUS

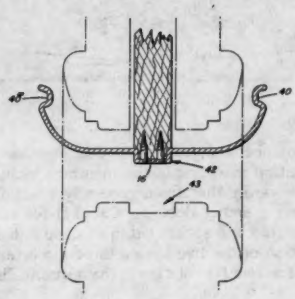
Willis E. Berry, Bloomington, Ill., assignor to National Union Electric Corporation, Stamford, Conn.

Filed March 5, 1971, Ser. No. 121,492
Int. Cl. A47l 9/02
U.S. Cl. 15—362 5 Claims



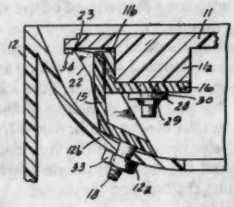
Vacuum cleaning nozzle apparatus for cleaning a shag-type rug comprising an assembly of two oppositely disposed spaced air guide members extending downwardly and inwardly from the outer longitudinal edges of a vacuum cleaner nozzle and having an air guide flange extending upwardly from the lower edge of each air guide member and terminating adjacent the air inlet opening of the nozzle to guide air downwardly into contact with the rug and then upwardly into the air intake opening of the nozzle and having a roller member extending substantially the length of the air guide members disposed between the air guide flanges which at least partially rollably supports the nozzle.

3,676,895
HARDWARE FOR SLIDING DOOR
James M. Stewart, West Palm Beach, Fla., assignor to Stewart Research, Inc., West Palm Beach, Fla.
Filed Aug. 24, 1970, Ser. No. 66,371
Int. Cl. A47b 95/02
U.S. Cl. 16—110 5 Claims



Door handles especially adapted for use on sliding "pocket" type doors permitting single hand opening and closing. Means is also provided adapting the handles for replacement of existing door operating means without carpentry work involving repair or remodeling of the previous carpentry.

3,676,896
HINGE AND DOOR DETENT
Le Roy R. Maleck, Galesburg, Ill., assignor to Admiral Corporation, Chicago, Ill.
Filed Feb. 5, 1970, Ser. No. 8,922
Int. Cl. E05f 1/12; E05d 7/00
U.S. Cl. 16—150 7 Claims

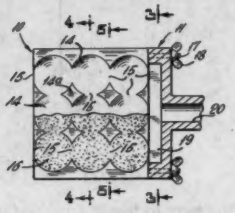


A hinge for swingably mounting a door or similar member in a frame characterized by a pair of flexible hinged portions integrally interconnected by a portion of reduced thickness. The flexible hinged portions extend from a base which has side members terminating in action surfaces slidably engaging the door structure to provide a pivot point for the door. The coaction between the action surface, the door and the flexible hinged portions cause an elastic deformation of the flexible member which acts as an over-center spring for the movement of the door. The base member has means for being attached to a door frame.

3,676,897
MECHANISM FOR FORMING A SUBSTANTIALLY SPHERICAL COMESTIBLE PRODUCT
Archangel J. Bianco, Box 93, Brookside, N.J.
Filed June 11, 1970, Ser. No. 57,021
Int. Cl. A22c 7/00
U.S. Cl. 17—32 4 Claims

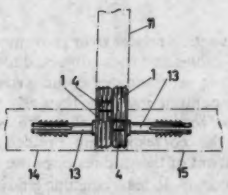
A comestible product which is formed rapidly in a mold in the shape of a meatball. The mold cavities are contiguous and the meatballs produced thereby are directly connected to each other without a separate connecting member. The comestible product can be cooked in the mold also by applying heat directly to the mold.

In order to make meatballs on a commercial as distinguished from a domestic scale, the processor takes ground



meat and rolls and pats it into a ball. The meatball is then cooked in a pan. The disadvantages of making meatballs in this fashion are that (1) the meatballs are not the same size, (2) the amount of meat varies from one meatball to the next, (3) the density of the meatballs varies, and (4) the juices are lost when the meatball is cooked and (5) the amount of time lost in making meatballs by hand is excessive.

3,676,898
CONNECTOR FOR PLATES
Erich Rock, Hochst, Austria, assignor to Julius Blum Gesellschaft m.b.H., Hochst, Austria
Filed Sept. 11, 1970, Ser. No. 71,435
Claims priority, application Austria, April 6, 1970, A 3084/70
Int. Cl. A44b 21/00; F04b 1/00; B25g 3/38
U.S. Cl. 24—73 PP 3 Claims

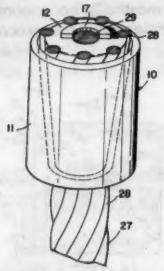


A connector is provided which is made of two coaxial parts having interengaging projections and recesses. The recesses are bounded by walls having saw tooth shaped grooves engaging like grooves on the projections. The parts also have saw tooth shaped peripheral grooves.

3,676,899
CABLE SHACKLE
Delbert D. Ehlert, Lake Olympia Road, Grass Valley, Nevada County, Calif.
Filed March 5, 1971, Ser. No. 121,491
Int. Cl. F16g 11/04
U.S. Cl. 24—122.6 7 Claims

A clamp for a convolute wire cable or the like including a socket member having a conically tapered recess extending therethrough and a unitary inner core portion of substantially conico-frustrum configuration seated in the recess with the convolute strands of the cable being secured within helical grooves formed on the outer periphery of the core portion. The core portion includes an elongated conically tapered smooth bore extending along its longitudinal center axis and has one side thereof enlarged with respect to the other. An inner wedge is disposed in the enlarged side of the bore and

mates with the other side forming a cylindrical central bore for receiving the center strand of the cable therein. In this manner, the inner wedge may be hammered down into the en-



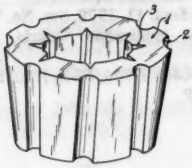
larged side of the bore to firmly grip the center strand of the cable while the socket member is forced onto the core portion to firmly grip the convolute strands of the cable within the socket member.

3,676,900

SYSTEM OF FIXING BRAIDED CABLES AND RODS SUBJECTED TO STRESS

Ricardo De Valenzuela, Villaverde 45, Barredo Madrid, Spain

Filed March 5, 1970, Ser. No. 16,699
Claims priority, application Spain, April 19, 1969, 366249
Int. Cl. F16g *11/02*
U.S. Cl. 24—126 L **2 Claims**



The present invention relates to improvements in the system of fixing braided cables and rods subjected to stress, which essentially consist in a truncated-conic crown of adequate thickness whose contour includes regularly spaced and sensibly semicircular recesses each of which is aimed to have housed therein the corresponding braided cable. Radially disposed and in front of the said recesses the same crown, but by its inner contour, includes triangular grooves weakening by that part the cross section of the crown in order to allow a deformation thereof permitting it to have a close adaptation to the necessary form and to obtain a retention pressure being practically uniform for all the cables.

3,676,901

ADJUSTABLE, QUICKLY RELEASABLE WEBBING CONNECTOR

Renzo J. Monti, Blackstone, Mass., assignor to The United States of America as represented by the Secretary of the Army

Filed Dec. 14, 1970, Ser. No. 97,646
Int. Cl. A44b *11/12, 11/00*; B68b *5/00*
U.S. Cl. 24—191 **2 Claims**

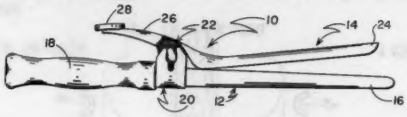
An adjustable, quickly releasable webbing connector having non-slip characteristics which make it particularly useful with webbing made of relatively slippery fibrous materials.

3,676,902

SPRING LOADED HINGE

Harold E. Pearson, West Hollywood, Fla., assignor to The Gillette Company, Boston, Mass.

Filed Feb. 9, 1970, Ser. No. 9,652
Int. Cl. A44b *21/00*
U.S. Cl. 24—2.52 HC **18 Claims**



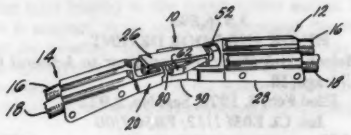
A pair of members hingedly connected together for relative rotation about an axis, one of the members including a stud extending outwardly therefrom generally coaxially with the axis, the other member defining a socket for receiving the stud, and the stud and socket being so sized and shaped that relative rotation of the two in one direction produces forces tending to cause relative rotation in the opposite direction.

3,676,903

SAFETY CLASP CONSTRUCTION

Leonard Klan, 1032 Sweet Street, N.E., Grand Rapids, Mich.

Filed May 6, 1970, Ser. No. 35,148
Int. Cl. A44c *5/18*
U.S. Cl. 24—265 **15 Claims**



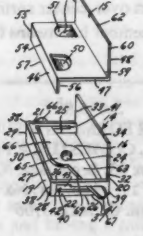
A safety clasp which ensures continued engagement of a bail end of a strap with the notched end of the strap, the clasp featuring a locking member attached to a cover which closes over the bail end when the latter is in the notch. The locking member is a spring rod doubled about itself so as to permit the bail end to compress it by camming when the locking member is passed through the bail. The doubling of the rod forms a bail-abutting surface that blocks the bail end from accidental movement along the cover towards the free end thereof. The spring rod is designed to allow deliberate compressing while simultaneously sliding the bail end thereover.

3,676,904

JEWELRY BRACELET CATCH

Boris Shteinshleifer, 40 Elizabeth Street, New York, N.Y.

Filed May 19, 1971, Ser. No. 144,738
Int. Cl. A44c *5/18*
U.S. Cl. 24—265 WS **3 Claims**



A jewelry bracelet catch of a type including first and second mutually engageable members, one of said members defining

a recess into which at least a portion of the other may be positioned for non-rotational engagement, said first member defining the recess and having a pivotally mounted latch member, the second member having a planar surface, which in engaged condition is parallel to the plane of said latch member, and having depending from the plane thereof at least one angularly configured tab selectively engageable with said latch member. In one embodiment of the invention, the safety means is pivotally mounted on one of said members to prevent accidental movement of said pivotally mounted latch member.

3,676,905

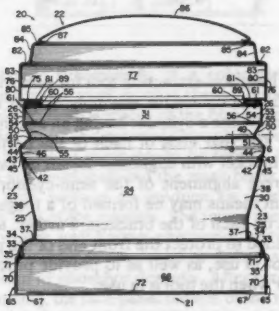
CASKET CONSTRUCTION AND METHOD OF MAKING SAME

Grant V. Mack, Valley Station, Ky., assignor to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 637,754, May 11, 1967, abandoned. This application March 31, 1970, Ser. No. 22,121

Int. Cl. A61g *17/00*

U.S. Cl. 27—6 **9 Claims**



This invention relates to an improved metal casket construction and an improved method of making such casket construction wherein a plurality of elongated extruded metal members are provided in standard lengths and suitably cut, formed, and fastened together to provide a high strength fluid tight casket. The side walls of the casket are formed by arranging the extruded metal members horizontally one above the other. The contiguous horizontal edges of adjacent metal members have flanges extending inwardly toward the center of the casket, and these flanges are fastened to one another in a fluid tight manner.

3,676,906

PROCESS FOR MAKING A PATTERNED FABRIC BY USING DIFFERENTIAL SHRINKAGE YARNS

Philip William Eggleston, Harrogate, England, assignor to Imperial Chemical Industries, Limited, London, England

Division of Ser. No. 757,479, Sept. 4, 1968, Pat. No. 3,587,220. This application June 16, 1970, Ser. No. 57,845

Claims priority, application Great Britain, Sept. 13, 1967, 41,795/67; July 12, 1968, 33,366/68

Int. Cl. D02g *1/18*

U.S. Cl. 28—72 FT **3 Claims**

This invention relates to a process of making woven or knitted fabrics which in their construction include yarns that contain or consist of melt colored polyester staple fibers and at least some of the yarn contains or consist of polyester staple fibers of at least 25 percent shrinkage.

3,676,907

NATURALLY FRAGMENTING PROJECTILES OF AISI 06 STEEL

Sigfred F. Magis, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 18, 1966, Ser. No. 530,251

Int. Cl. B21k *21/06*

U.S. Cl. 29—1.21 **1 Claim**

A method of making a mortar shell of AISI 06 steel, and the product produced thereby, comprising forging the steel to a rough shape, rough machining the forged article, heat treating said article to approximately 1,750° F for approximately 2 hours, air-cooling said article, tempering said article at approximately 500° F for approximately 1 hour and finish machining said article to completion.

3,676,908

BROADENING AND STRETCHING ROLLER FOR FLEXIBLE WEBS

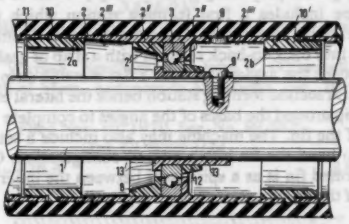
Hans Wittler, and Heinz-Otto Holtkamp, both of Brackwede, Germany, assignors to H. Wittler & Co. KG, Brackwede, Germany

Filed Nov. 9, 1970, Ser. No. 88,078

Claims priority, application Germany, Nov. 12, 1969, P 19 56 846.8

Int. Cl. B21b *13/02*

U.S. Cl. 29—116 AD **15 Claims**



This invention relates to a broadening and stretching roller for flexible webs such as webs of textile, paper or plastics material. An outer shell of the roller is mounted on a shaft by means of bearings which in turn are secured between the shell and the shaft by mounting means comprising end cups, tubular section members, and ring means. All of these bearing mounting means are made of plastics material such as duro-plastics or thermo-plastics. Corrosion resistant sleeves of metal and/or of plastics material are secured to the end of the shaft in such position as to be partially overlapped by said end cups.

3,676,909

ROLLER

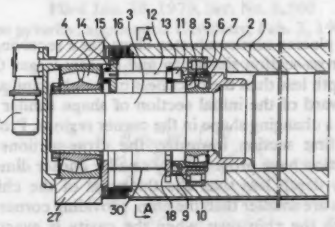
Jorma A. K. Tuomaala, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed June 1, 1970, Ser. No. 42,237

Claims priority, application Finland, June 4, 1969, 1669/69

Int. Cl. B21b *27/00*

U.S. Cl. 29—110 **1 Claim**



Inside a tubelike mantle a shaft is attached at the middle of the mantle and the shaft has roller bearings at both ends for rotating the mantle on a support or stand. The mantle is

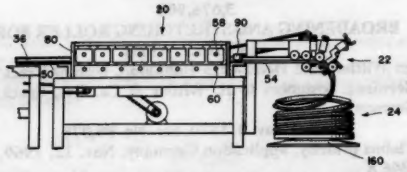
furthermore supported at one or several points between the point at which the shaft is attached to the mantle and the end of the mantle by supporting means mounted either inside the mantle on the shaft or outside the mantle on the support, stand, base or the like.

3,676,910

MACHINE FOR FORMING HEAT-EXCHANGER FINS

Frank Robert Gross, Akron, Ohio, assignor to F. R. Gross Co. Inc., Akron, Ohio

Filed Nov. 19, 1970, Ser. No. 91,052
Int. Cl. B23p *15/26, 11/00*
U.S. Cl. 29—202 D **11 Claims**



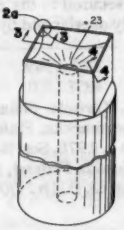
Disclosed is a machine for forming T-shaped fins having a sealing gasket projecting from the leg portion of the T. The machine includes a first forming station which forms two parallel strips into angles. An assembly section guides the two angles into back-to-back relation with a strip of gasket material between the angles and with a flat metallic strip below the angles. A second forming station bends the lateral edges of the flat strip around the bases of the angles to complete the formation of the fin. The machine may also include a set of curling rolls to bend the fin into a curved configuration. One use of the formed fin is as a spiral seal between the inner and outer rolls of the fluid heat-exchanger type roll.

3,676,911

HOLDING TOOL

Frank C. Austin, 9 Meadow Road, Rockport, Mass.

Filed Nov. 12, 1970, Ser. No. 88,754
Int. Cl. H05k *13/04*; B23p *13/04*
U.S. Cl. 29—203 V **8 Claims**



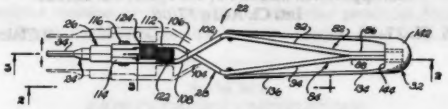
Tool for placing semiconductor chips has a receiving cavity of initial cross-section similar to and slightly larger than the chip, of depth less than the thickness of the chip and a second section inward of the initial section of shape similar thereto but having a changing shape in the corner regions. Proceeding from the first section inwardly, the cross-sections of the second section have progressively smaller corner dimensions; at a cavity depth less than the thickness of the chip these dimensions are smaller than the chip, providing corner regions upon which the chip rests when the cavity is evacuated to draw in a chip. Also a method of forming such a tool using a bar of electrode stock shaped in prism form with rounded end corner regions conforming to the projection of a cone pointed outwardly from the end. This electrode is used in an EDM process to form an impression in a blank of hard metal, and the surfaces surrounding the impression are machined to define thin walls to complete the tool. The electrode is redressed simply by rechucking the bar and returning the conical surface.

3,676,912

ELECTRICAL CONTACT INSERTION-EXTRACTION TOOL

John W. Anhalt, La Crescenta, and Robert M. Morrison, Glendale, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed March 31, 1971, Ser. No. 129,786
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 H **6 Claims**



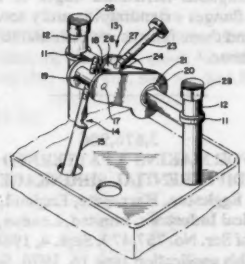
A contact insertion-extraction tool for removing an electrical contact from a connector assembly. A pair of semi-cylindrical portions define a cylinder having an opening at the front end thereof. The rear ends of each of the portions are each secured to a bracket with alignment means on said bracket for assuring correct alignment of the semi-cylindrical portions. The alignment means may be formed of a tongue and groove arrangement on each of the brackets. Further, a tip protector may be provided to protect the front end of the portions when the tool is not in use, as well as to provide protection for the tool operator when the tool is in use.

3,676,913

COMPRESSOR FOR CAM FOLLOWER SPRING

John Fagen, 2318 W. Fourth Avenue, Kennewick, Wash.

Filed Feb. 19, 1971, Ser. No. 116,921
Int. Cl. B23p *19/08*
U.S. Cl. 29—217 **5 Claims**



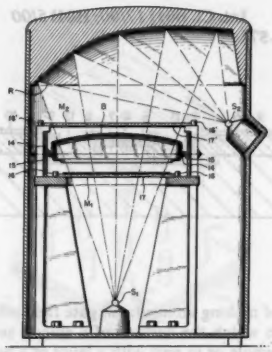
The present invention is directed to a tool for use on diesel engine cylinder heads having a plurality of recessed cam follower springs secured under compression in recesses within the cylinder head by follower spring seat retainers. The tool of the present invention can be removably secured to the cylinder head and will serve to compress the cam follower spring to permit removal of the follower spring seat retainer and subsequent removal of the cam follower assembly.

3,676,914

MANUFACTURE OF SHADOW MASK COLOR PICTURE TUBE

Joseph P. Flore, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed May 1, 1970, Ser. No. 33,766
Int. Cl. H01j *9/18, 9/36*
U.S. Cl. 29—25.16 17 Claims



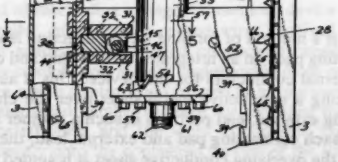
The mask-frame subassembly of a color picture tube is made with the formed mask portion thereof imperforate and, therefore, a blank. Both surfaces of the blank are coated with a photosensitive resist and exposed through master patterns to create latent images of apertures to be formed in the blank. These images are developed and the mask blank is thereafter etched from both surfaces to produce an aperture pattern determined by that of the masters. The image area of the tube is screened through well-known photoprinting techniques in which a second master is employed to define and precisely locate the pattern of phosphor deposits. After screening, filming and aluminizing, the face panel section of the tube receives the aperture mask-frame subassembly and the tube processing then continues in conventional manner. In developing an aperture pattern in the mask blank and in screening the face panel, a system of studs and leaf springs or supports is employed to establish a coupling of kinematical design. This is characterized by unique positioning of the coupled elements with their geometric centers in a known reference location and makes possible interchangeability of masks and panels.

3,676,915

HYDRAULIC PRESS

Glen V. Ireland, 6605 W. Bennett Avenue, Milwaukee, Wis.

Filed Nov. 9, 1970, Ser. No. 87,918
Int. Cl. B23p *19/02;* B30b *1/32*
U.S. Cl. 29—251 8 Claims



A hydraulic press including a frame having a base and a pair of vertical columns which extend upwardly from the base, and a cross head is mounted for vertical movement on the columns. Both the base and the columns are hollow and provide a reservoir for hydraulic fluid. The workpiece is supported on a table which is movable on the base from a loading position to a position beneath the cross head. The cross head carries a cylinder unit and the vertical position of the crosshead can be varied with respect to the columns by a cam-actuated locking unit. By releasing the locking unit and bearing the piston rod of the cylinder unit against a fixed object, the cylinder and cross head can be raised and lowered to the desired height with respect to the supporting columns.

3,676,916

METHOD FOR PREPARING METAL MOLDING COMPOSITIONS

Royce G. Schierding, St. Charles, and Tommy L. Tolbert, Chesterfield, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 2, 1970, Ser. No. 406
Int. Cl. B23p *17/00;* B22f
U.S. Cl. 29—419 3 Claims

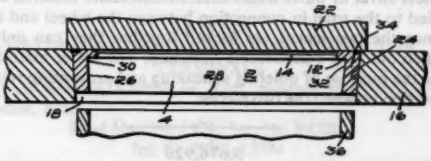
Moldable pellets consisting essentially of a metal matrix having boron filaments positioned therein substantially in parallel and separated from each other by said metal; the method of producing the pellets, and the process of manufacturing shaped composite structures wherein said pellets are molded to the desired shape, e.g., by extrusion or transfer molding.

3,676,917

METHOD OF MAKING A POROUS METAL SPINNING RING

Andrew J. Wayson, Needham, and John T. O'Connell, Medfield, both of Mass., assignors to Merriman, Inc., Hingham, Mass.

Filed Nov. 10, 1970, Ser. No. 88,262
Int. Cl. B22f *3/24*
U.S. Cl. 29—420.5 4 Claims



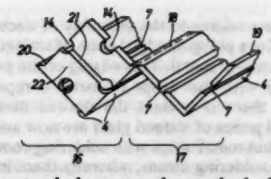
A powdered metal spinning ring in which the ring, after being initially formed in a press and sintered is then compressed circumferentially to taper the ring body so that the inner wall is in the form of an inverted truncated cone. The exterior of the ring is then machined in conventional manner after which the ring is heat treated and polished to be ready for use in a spinning frame.

3,676,918

METHOD OF MAKING STRUCTURAL ELEMENT

Artur Fischer, Altheimer Str. 219, D-7241 Tumlingen, Germany

Filed Jan. 28, 1970, Ser. No. 6,500
Claims priority, application Germany, Feb. 3, 1969, P 19 05 219.8
Int. Cl. B23p *11/02*
U.S. Cl. 29—453 1 Claim



A hollow structural element and a method of making the same are disclosed. The structural element is bounded by

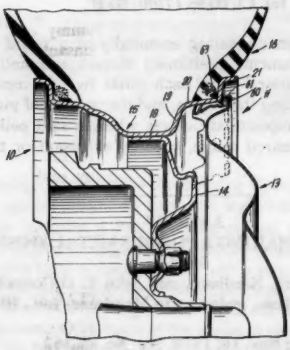
outer peripheral walls at least some of which are provided with coupling elements. It consists of a plurality of discrete sections which together have the configuration of the completed hollow structural element, and which are assembled and connected with one another, releasably or non-releasably, so as together have the configuration of the structural element.

3,676,919

PROCESS FOR MAKING A WHEEL TRIM LOCK RING ASSEMBLY

Herbert Buerger, Walton, N.Y.

Filed May 11, 1970, Ser. No. 36,336
Int. Cl. B23p 21/00
U.S. Cl. 29—469 5 Claims



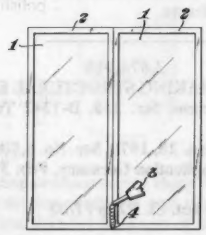
The lock ring is snapped into locking engagement with a wheel cover or other wheel trim. Mastic sealer material is applied to the snap in connection between the wheel and trim. Once the two pieces are locked together they can only be taken out with considerable difficulty. The sealer material is for the purpose of quieting squeaking and preventing relative rotation between the two pieces.

3,676,920

JOINING PROCESS FOR THE ASSEMBLY OF DECORATIVE, STAINED GLASS

Robert M. Pilditch, 2810 Garfield St., Bay City, Mich.

Filed June 22, 1970, Ser. No. 48,275
Int. Cl. B23k 31/02
U.S. Cl. 29—472.5 5 Claims



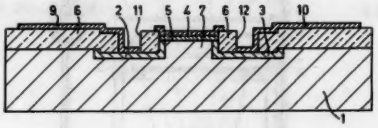
This process relates to the assembly of decorative, stained glass, whereby a polygon-edged pane of stained glass is edged with a thin strip of metal. This edging of the polygon pane of stained glass with thin strips of metal is repeated on other panes until there is present the desired number of panes. These edged panes of stained glass are now assembled by soldering the thin metal strips with soldering composition under appropriate soldering means, whereby there is assembled the desired decorative, stained glass configuration.

3,676,921

SEMICONDUCTOR DEVICE COMPRISING AN INSULATED GATE FIELD EFFECT TRANSISTOR AND METHOD OF MANUFACTURING THE SAME

Else Kooi, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 727,563, May 8, 1968, Pat. No. 3,544,858.
This application March 16, 1970, Ser. No. 19,849
Claims priority, application Netherlands, June 8, 1967, 6707956
Int. Cl. B01j 17/00; H01l 5/00
U.S. Cl. 29—571 20 Claims



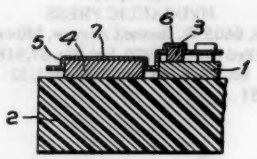
Method of making an insulated gate field effect transistor is described in which the surface of a silicon semiconductor is covered in whole or in part with a layer of a masking material which masks against oxidation, such as silicon nitride. Areas of the silicon surface are exposed for the source and drain regions, leaving the oxidation mask over the future channel. When the source and drain regions have been made, as for example by diffusion, the device is subjected to oxidation, causing the growth of a thick oxide which sinks into the silicon surface where it is not masked by the oxidation mask. Among the advantages obtained are fewer precise masking steps, a flatter device surface, and reduced gate overlap of the source and drain.

3,676,922

METHOD OF FABRICATING A SEMICONDUCTOR DEVICE

Charles R. Cook, Jr., North Palm Beach, Fla., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Feb. 13, 1970, Ser. No. 11,225
Int. Cl. B01j 17/00; H01l 1/16
U.S. Cl. 29—577 6 Claims

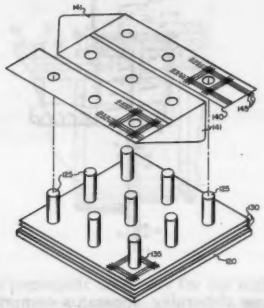


This is a method of forming interconnection leads between connecting pads on an integrated circuit chip and corresponding external conductors for the device. This is accomplished by placing a conductive metal sheet over the chip and surrounding external lead portions in such a manner as to visibly locate each connecting pad and external lead; then each portion of the overlying conductive sheet is bounded to each underlying connecting pad and external lead; the desired interconnection pattern between each of the connecting pads and each of the external leads is formed on the conductive sheet; and portions of the conductive sheet are then removed thus leaving the desired interconnection leads.

3,676,923
METHODS OF PRODUCING SOLENOID ARRAY MEMORIES

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Division of Ser. No. 735,319, June 7, 1968, Pat. No. 3,535,690.
This application March 16, 1970, Ser. No. 19,569
Int. Cl. H01f 7/06
U.S. Cl. 29—604 4 Claims

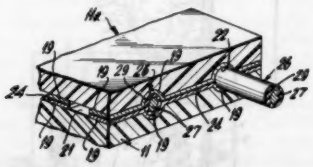


Read only data planes for use with solenoid array memories are woven by processes which employ weaving conductive and non-conductive strands of material as both the warp and the woof (filler) of a fabric. The data planes take two basic forms, one being a woven mat of substantially the same length and width dimensions of its associated memory stack, and another being in the form of a strip which may be folded back and forth, the folded sections being co-extensive to form the data plane. Coding is effected by interrupted and/or connecting selected conductors.

3,676,924
METHOD OF FABRICATING A MAGNETIC MEMORY MATRIX

John M. Cole, New Hope, Pa., and William Sinclair, Frenchtown, N.J., assignors to Thomas & Betts Corporation, Elizabeth, N.J.

Filed July 13, 1970, Ser. No. 54,269
Int. Cl. H01f 7/06; G11b 5/62
U.S. Cl. 29—604 10 Claims

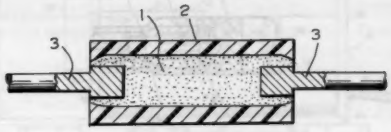


A method of fabricating a magnetic memory device having spaced, parallel, magnetically coated wires received within tunnels and spaced parallel word conductors crossing the magnetically coated wires at right angles and in close proximity thereto, in which a substrate is formed to have a contoured surface of elongated parallel recesses for receiving the magnetically coated wires and the word conductors are electroplated directly onto the contoured surface of the substrate to follow the shape of the substrate surface. The exposed conductive surfaces of the plated word conductors are then coated with a thin film of insulative material and the completed structure forms one side of the memory that is joined to an identical, similarly formed mating opposite dise.

3,676,925
METHOD FOR MAKING MOLDED CARBON COMPOSITION RESISTORS

Kunio Sato; Kanji Sugihara; Takashi Wakabayashi, and Tomio Ishida, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 28, 1970, Ser. No. 58,780
Int. Cl. H01c 1/02, 17/00
U.S. Cl. 29—613 3 Claims

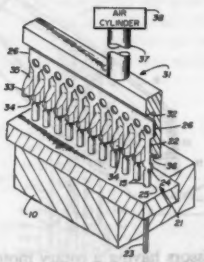


A method of making a molded carbon composition resistor. A core mixture is prepared from a finely divided carbon black or graphite powder and silica powder in a resin at an elevated temperature for giving it the proper plasticity, and the mixture is cooled and crushed into granules. A sleeve mixture is prepared from silica powder in a resin at an elevated temperature for giving it the proper plasticity, and the sleeve mixture is cooled and crushed into granules. The core mixture is formed into an inner core and the sleeve mixture is formed into a sleeve around the inner core. Electrodes are inserted into the ends of the inner core. The method is improved in that prior to the steps of mixing it with the other materials, the silica powder for either the core mixture or the sleeve mixture, or both, is heated to a temperature of from 700 to 1500° C.

3,676,926
METHOD FOR MANUFACTURING CONNECTOR TERMINALS

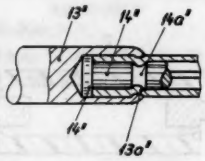
Jerry A. Kendall, Carrollton, Tex., assignor to Elfab Corp., Dallas, Tex.

Filed May 20, 1970, Ser. No. 39,089
Int. Cl. H05k 13/04
U.S. Cl. 29—625 8 Claims



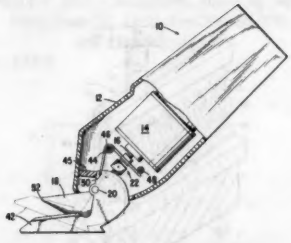
A plurality of electrical connector terminals are formed as part of a common metal strip. The terminals are first inserted into prepunched holes in a mounting board while they are still attached to one another as part of the strip. The terminals are next all press fit simultaneously into the mounting board holes. The strip which connects them together is then broken free and discarded to separate the terminals from one another and leave the individual connector terminals mounted in the board.

3,676,927
METHOD OF MAKING A CONNECTOR PLUG
Robert Maier, Esslingen am Neckar, Staffelesweg 10, Germany
Filed Sept. 15, 1969, Ser. No. 857,757
Claims priority, application Germany, June 18, 1969, P 19 30 806.6; Dec. 23, 1968, P 18 16 614.8
Int. Cl. H02q 15/00
U.S. Cl. 29—629 1 Claim



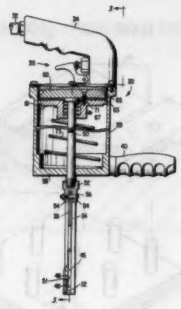
A plug or socket for a plug-and-socket connection is produced by forming a member which includes a main body portion having a plurality of longitudinally extending separate parts of substantially uniform cross section throughout their lengths and an end part connecting the longitudinally extending parts to each other at one end, and thereafter securing one end of the member in a connecting part. The member may be formed by drilling a longitudinally bore into a grooved rod with a radius at least as great as the radius of the roots of grooves running longitudinally of the member leaving a connecting part at one end. It may also be produced by bending an elongated member of semicircular cross section through 180° and securing the free ends in the connecting part by welding two rods of similar cross section at intervals, cutting off a part adjacent one of the welds, separating the resulting legs apart and then bringing them together in a connecting member.

3,676,928
ELECTRIC SCISSORS
John A. Herr, Gardwood, and Oswald M. Porter, Livingston, both of N.J., assignors to The Singer Company, New York, N.Y.
Filed July 1, 1970, Ser. No. 51,466
Int. Cl. B26b 15/00
U.S. Cl. 30—228 8 Claims



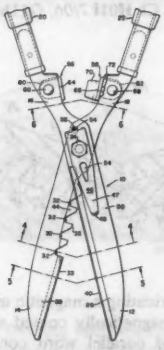
An electric scissors having a rotary motor for oscillating a pivotal cutting blade to effect a cutting engagement along a small portion thereof with a ledger blade. The ledger blade, which is normally non-movable during the cutting operation, is mounted such that it may be selectively pivoted into engagement with the cutting blade to effect a snip cutting stroke along substantially the entire cutting blade or a portion thereof. Two embodiments are shown for effecting the snip cut. A first embodiment biases the ledger blade in a normally fixed position by a torsion spring which may be compressed to effect a snip by pushing the ledger blade against a table-like surface. The other embodiment disclose a lever arrangement whereby the ledger blade is pivoted to effect a snip by manually squeezing a lever-link against the force of a spring.

3,676,929
ANIMAL DEHORNING APPARATUS
Donald R. Nicholson, Route 1, Box 102, Colby, Kans.
Filed Nov. 7, 1969, Ser. No. 874,813
Int. Cl. B26b 15/00
U.S. Cl. 30—228 11 Claims



A shear-type dehorning apparatus comprising a pair of generally parallel guide brackets or rails, a fixed blade attached at one end and a shearing blade guided between the pair of guide rails and connected to a piston within a cylinder. A hand operated valve is an integral part of a handle on the cylinder housing and controls introduction of compressed gas from a storage container to thereby provide a power actuated dehorner requiring neither electricity nor an auxiliary engine for operation.

3,676,930
HEDGE SHEARS
James W. Robison, Belpre, Ohio, and Harold L. Eads, Parkersburg, W. Va., assignors to O. Ames Division of McDonough Company, Parkersburg, W. Va.
Filed July 17, 1970, Ser. No. 55,691
Int. Cl. B26b 13/08
U.S. Cl. 30—257 5 Claims

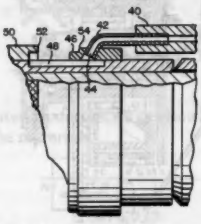


A hedge shears having pivotal shearing and work holding blades. A pivot mounted tensioning spring resiliently biases the blades together for pressured, adherent action from the pivot to the tips. Resilient stop means are rigidly supported on the blades and to compressively engage upon their closing fully together. Work holding notches are formed in the holding blade, shaped or oriented to receive varying size work and firmly hold that in compressing and slicing by the shearing blade.

3,676,931
SPEED CONTROL FOR DENTAL HANDPIECES

Helmut Richard Pietschmann, Karlsruhe, Germany, assignor to Sybron Corporation, Rochester, N.Y.

Filed Aug. 21, 1970, Ser. No. 65,863
Claims priority, application Germany, Sept. 28, 1969, P 19 48 059.2
Int. Cl. A61c 1/10
U.S. Cl. 32—27 6 Claims

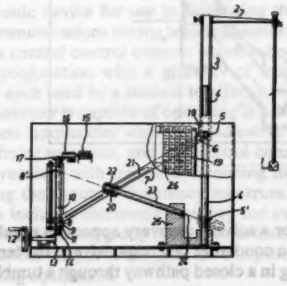


Disclosed is a pneumatic controller for use with electrically or pneumatically driven dental handpieces wherein the controller has a portion mounted directly on the handpiece and in associated with a conventional foot controller so that the speed of the handpiece may be controlled by either the portion mounted on the handpiece or by the conventional foot controller.

3,676,932
DEVICE FOR THE PREPARATION OF MIXTURES OF LIQUIDS IN PRE-DETERMINED PROPORTIONS AND QUANTITIES

Charles F. Druet, 43 Allee des Charmilles, 93 Livry-Gargan, France

Filed May 18, 1970, Ser. No. 38,350
Claims priority, application France, Nov. 6, 1969, 6938269
Int. Cl. G01f 23/04
U.S. Cl. 33—126.7 A 2 Claims

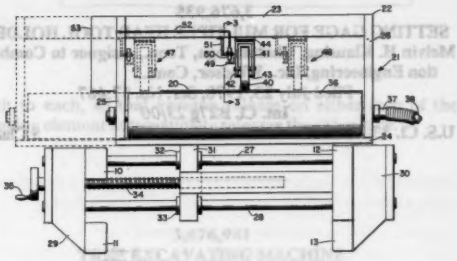


A device for the preparation of mixtures of liquids in predetermined proportions and quantities, comprising the combination of a gauge adapted to be displaced vertically, a device serving as a meter and indicating the position of said gauge, a driving system for said meter and a transmission lever interposed between said gauge and the driving system of said meter, said transmission lever being pivotally mounted about a shaft which is adjustable in position so as to vary the position of said gauge for the same value indicated on said meter. The gauge may be either of the blade type or a float co-operating with a needle and graduated scale.

3,676,933
CONTINUOUS THICKNESS MEASUREMENT OF A MOVING PLASTIC WEB

Thomas J. Slone, Forest Park, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Oct. 9, 1969, Ser. No. 865,120
Int. Cl. G01b 5/00, 5/14, 7/00
U.S. Cl. 33—147 L 4 Claims

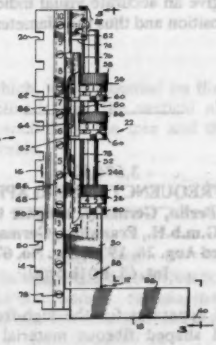


The thickness of a moving plastic web is continuously monitored as it passes between a pair of co-acting rollers including a web support roller driven at a peripheral speed which corresponds to the linear speed of the moving web and a freely rotating idler roller mounted over the support roller. The periphery of the idler roller is in contact with the web passing over the support roller. The idler roller is resiliently mounted to permit radial movement in response to variations in web thickness. An electromagnetic proximity sensor is associated with the idler roller to sense and detect changes in its relative position which are ultimately transmitted to a control or recorder. The device includes a suitable mechanism for simultaneously moving the rollers laterally with respect to the web in order to obtain a web thickness profile.

3,676,934
PRECISION DIGITAL LINEAR ADJUSTMENT MECHANISM AND HEIGHT GAGE EMBODYING SAME

Edgar P. Freer, Canoga Park, Calif., assignor to Hubach-Freer Corporation, Los Angeles, Calif.

Filed March 13, 1970, Ser. No. 19,207
Int. Cl. G01b 3/22
U.S. Cl. 33—169 R 14 Claims



A precision digital adjustment mechanism for a linear distance gaging device having a pair of gage members connected for relative movement along a direction line normal to parallel gaging surfaces on the members. The digital adjustment mechanism employs a number of accurately calibrated

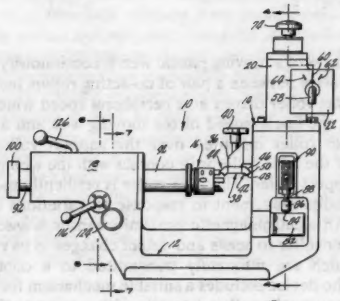
gage pins of graduated length mounted in holding means which are adjustable to locate selected combinations of the gage pins in gaging positions, the selected gage pins precisely establish the spacing between the gaging surfaces. A height gage embodying the digital adjustment mechanism.

3,676,935

SETTING GAGE FOR MULTIPLE HEAD TOOL HOLDER

Melvin H. Klausing, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed July 23, 1970, Ser. No. 57,467
Int. Cl. B27g *23/00*
U.S. Cl. 33—185 R **5 Claims**



A setting gage for a multiple head tool holder wherein the cutting tools thereof are properly aligned to permit complete machining of tube ends in one operational step. A gage block is configured so as to have the shape of the desired finished tube ends; and its vertical location is controlled by a block actuating motor to position the gage block relative to the axis of the multiple head tool holder so that the block represents a tube with the radius of the tube desired to be operated upon. A numerical counter is interrelated with the vertical control motor so as to give an accurate visual indication of the gage block vertical position and thus the diameter of the tube to be operated upon.

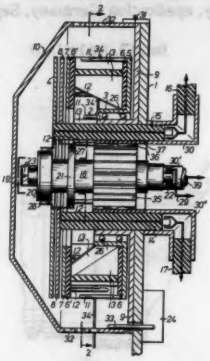
3,676,936

HIGH-FREQUENCY DRYING APPARATUS

Herbert Hanff, Berlin, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Germany

Filed Aug. 26, 1970, Ser. No. 67,139
Int. Cl. B01k *5/00*
U.S. Cl. 34—1 **8 Claims**

An improved apparatus for the high-frequency drying of strip or thread shaped fibrous material in a continuous process. The high-frequency drying field is produced between adjacent opposite polarity elongated electrodes disposed in the peripheral surface of a rotatably mounted electrode structure or arrangement in the shape of a truncated cylinder. At least one of the side or end plates of the cylinder is provided with an opening to provide the intake of a ventilation channel, which includes the interior of the cylinder between the two side plates and whose outlet passes through the space between adjacent electrodes. The power tube for the high-frequency



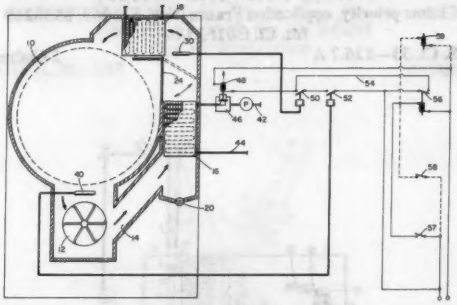
generator is disposed in the ventilation channel at least partially in the axial space between the two side plates.

3,676,937

SOLVENT RECLAIMER CONTROLS

Harry W. Janson, Fairhaven, Mass., assignor to Hoyt Manufacturing Corporation, Westport, Mass.

Filed Oct. 22, 1970, Ser. No. 83,041
Int. Cl. F26b *21/06*
U.S. Cl. 34—46 **2 Claims**



Controls for a solvent recovery apparatus regulate the flow of coolant in a condenser coil responsive to the temperature of air circulating in a closed pathway through a tumbler.

3,676,938

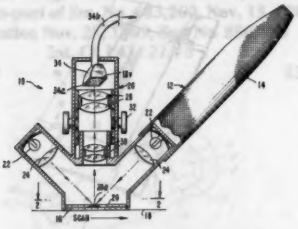
READING DEVICE FOR THE BLIND

Arnold Trehub, 145 Farview Way, Amherst, Mass.

Filed Sept. 1, 1970, Ser. No. 68,722
Int. Cl. G09b *21/00*; G06k *9/13*
U.S. Cl. 35—35 A **15 Claims**

An arrangement to permit blind persons to "read" printed characters by converting such characters into audible analog signals. Means are included for detecting the presence or absence of characters, their size, shape and orientation, and their grouping into words, sentences or paragraphs. Each of these identifying parameters is translated by electro-optical

responsive equipment into distinctive and audible tonal sounds which are associated by the "reader" with the corresponding printed materials, thus allowing continuous comprehension of the materials.



3,676,939

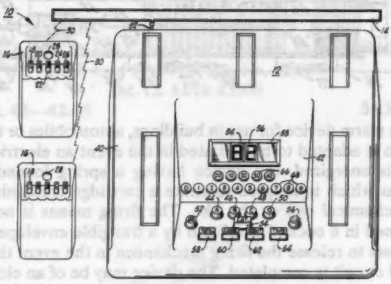
STUDENT RESPONDER TEACHING DEVICE

Charles V. Oberst, and Glen C. Oberst, both of Norman, Okla., assignors to EdAids, Inc., Norman, Okla.

Continuation-in-part of Ser. No. 744,940, July 15, 1968, abandoned. This application April 17, 1970, Ser. No. 29,620

Int. Cl. G09b 7/06

U.S. Cl. 35—48 R 11 Claims



An electronic device for use in facilitating the teacher-to-students communications during tutoring sessions. The device consists of a central control console which is operated by the teacher in conjunction with a plurality of individual transmitter units each used by a student to effect a response. Each student transmitter is capable of operating at a selected one of plural discrete frequencies which are indicative of a selected answer or choice selection, and the control console utilizes a heterodyne receiver with frequency scanning means capable of monitoring the required frequency spectrum. The control console also includes electronic circuitry for evaluating and displaying individual and group student information thereafter to provide further output of the data for computer and related data processing equipment.

3,676,940

ANTI-SLIP APPARATUS

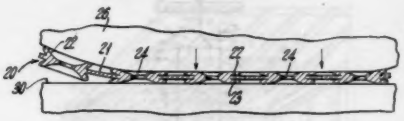
John J. Shively, 515 E. 89th St., New York, N.Y.

Filed Aug. 11, 1970, Ser. No. 62,817

Int. Cl. A43b 5/08

U.S. Cl. 36—8.1 1 Claim

A film or web of rubber or the like is formed with patterns of small closely spaced vacuum cups on each of its faces. When compressed between two surfaces, both of which are smooth, the cups of the two faces grip the two respective surfaces to restrain slippage, but due to the small size of the individual cups, local release is prompt as the area of applied pressure shifts. In applications such as bathing sandal soles or baseball bat grips, aligned cups of the two faces may be vented each to each, so that vacuum release on either face of the gripping element automatically releases the other face.



3,676,941

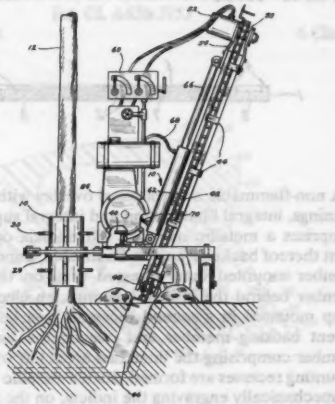
TREE EXCAVATING MACHINE

Arthur H. Cohrs, 124 Fifth Ave. North, Hopkins, Minn., and Franklin T. Kresse, Route 2, Box 193, Maple Lake, Minn.

Filed Sept. 24, 1969, Ser. No. 860,655

Int. Cl. A01g 23/06

U.S. Cl. 37—2 R 9 Claims



A tree digger which, when mounted on the base of a tree, digs a trench inclined from the vertical about same, the distance of the trench from the tree and the depth of the trench being adjustable.

3,676,942

RECORD DISPLAY DEVICE

Daniel W. Elrod, 4512 N. 14th St., Omaha, Nebr.

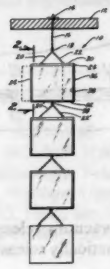
Filed May 20, 1970, Ser. No. 39,012

Int. Cl. G09f 1/10

U.S. Cl. 40—124.2 1 Claim

A record display device comprising a plurality of vertically spaced transparent jacket support members adapted to receive and support a record jacket therein. The uppermost support member is suspended from a suitable support means with the other support member being supported from the support member thereabove. The support members are rotatable

about a vertical axis with respect to the other support members. In the modified form of the device, the record jackets are



supported in a vertically spaced relationship by a transparent strap means extending therearound and therebetween.

3,676,943

NON-FLAMMABLE, THIN, INTEGRALLY ILLUMINATED CONTROL PANEL OVERLAY

Thomas L. Kidd, Jr., Norristown, and Albert D. McClain, Jr., Philadelphia, both of Pa., assignors to General Electric Company

Division of Ser. No. 706,044, Feb. 16, 1968. This application July 27, 1970, Ser. No. 64,879
Int. Cl. G09f *13/22*
U.S. Cl. 40—130 M 2 Claims

A non-flammable control panel overlay with legible indicia openings, integral illumination and integral supporting means comprises a metallic member with indicia openings on the front thereof backed by a non-flammable, transparent backing member mounted in a recessed area on the back of the member behind the indicia openings, an electroluminescent lamp mounted in a second recessed area behind the transparent backing member and ribs on the back side of the member comprising the unetched areas left when the various mounting recesses are formed. Such a metallic overlay is made by mechanically engraving the indicia, on the front of a metal blank and then chemically etching the rear of the blank, in a stepwise fashion to form the various recesses and remove unnecessary material, until breakthrough to the indicia occurs.

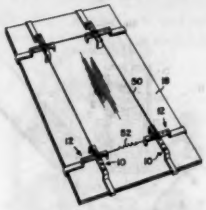
3,676,944

PICTURE FRAME

Joseph P. Eubank, Jr., 2218 Mount Vernon St., Philadelphia, Pa.

Filed Jan. 4, 1971, Ser. No. 103,602
Int. Cl. G09f *1/12*
U.S. Cl. 40—155 9 Claims

A picture frame comprising four pairs of bracket members, one pair associated with each corner of a picture assembly. Each bracket engages one of the edges of the picture assembly near a corner thereof and has a post member contacting the back of the picture frame assembly. There is also provided a connection between each associated pair of brackets at a medial location, the brackets being arranged to extend perpendicular from an edge of the picture assembly and to cross each other at said medial location. There is also provided a cord which interconnects all the bracket connections and which is spring biased to be maintained in tension to urge the four associated bracket pairs inwardly toward the center of the picture so that a truss-like action is provided with the post



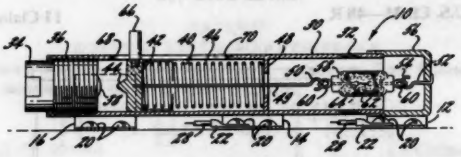
member of each bracket being urged toward the back of the picture assembly.

3,676,945

CARTRIDGE LOADED ALARM DEVICE

Nick C. Neanhouse, 7133 W. 109th St., Worth, Ill.

Filed Oct. 8, 1970, Ser. No. 79,237
Int. Cl. F41c *3/04*; E05g *3/00*; G08b *15/02*
U.S. Cl. 42—1 G 8 Claims



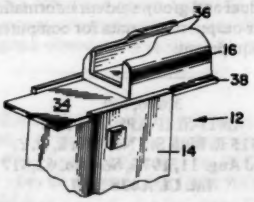
An alarm device for use in buildings, automobiles or the like which is adapted to be actuated in the event an electrical circuit is energized, the device having a spring loaded firing means which is adapted to strike a cartridge containing tear gas, chemical dye or the like. The firing means is normally retained in a cocked condition by a frangible envelope which shatters to release the firing mechanism in the event the electrical circuit is completed. The device may be of an elongated cylindrical configuration that may be inserted within clips in a manner similar to the installation of conventional cartridge fuses.

3,676,946

TWO-PART CARTRIDGE MAGAZINE

Alfred F. Sibilia, Will Palmar Road, Southwick, Mass.

Filed Nov. 24, 1969, Ser. No. 879,136
Int. Cl. F41c *25/02*; F42b *39/00*
U.S. Cl. 42—50 3 Claims

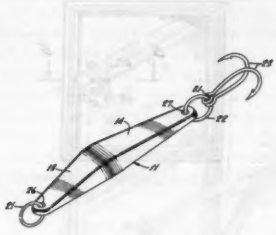


A two-pat cartridge magazine comprises a first part in the form of a head unit, and a second part in the form of a container unit wherein the head unit is removably mounted on the container unit so as to be usable on each of a plurality of container units.

3,676,947
MUZZLE CHOKE
Clifford Logan Ashbrook, 5027 Cheena, Houston, Tex., and Wilson Gordon Wing, 35 E. Rivercrest Drive, Houston, Tex.
Continuation-in-part of Ser. No. 683,200, Nov. 15, 1967. This application Nov. 28, 1969, Ser. No. 880,870
Int. Cl. F41c *21/18*
U.S. Cl. 42—79 23 Claims

A shotgun muzzle or nozzle construction for producing a uniformly distributed pattern of shot or projectiles within a predetermined confined area. The forward section or diverter is provided with a plurality of internal axially extending shot- or projectile-diverting ridges which define wall means for selectively guiding the projectiles into relative orientation to one another. The ridges define a plurality of walls, the purpose of which is to establish the pattern of projectiles upon a target. Precalculated angular relationships of the various walls and diverter ridges thereon contribute to marked effectiveness of the device.

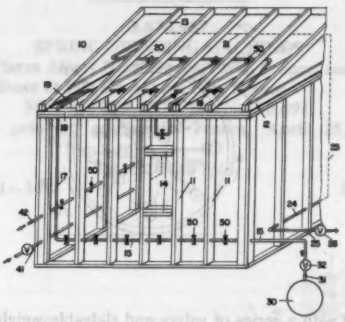
3,676,948
FISHING LURE
Richard L. Hill, 11140 E. Imperial Highway, Norwalk, Calif.
Filed Aug. 10, 1970, Ser. No. 62,348
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.45 3 Claims



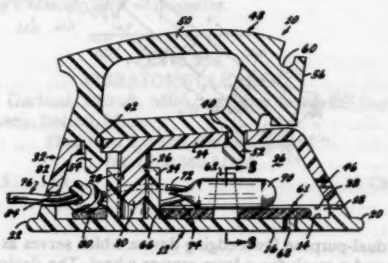
A fishing lure for deep water fishing comprises an elongated body, having a specific gravity of not less than 10.5 nor more than 19.3, and diminishing in thickness in opposite direction of its length from a point distant from one end by five-twelths of its total length. Two generally flat surfaces that are contiguous at the point of maximum thickness and fall away beginning at that point to define the diminution in thickness of the body, form the sides of an included angle of between 164° and 170°. At one end the body is adapted to be joined to a line and at its other end it carries two single hooks freely suspended, facing in opposite directions and in overlapping relation.

3,676,949
INSECTICIDE DISTRIBUTION SYSTEM
Roy L. Ramsey, 3200 N. 14th St., Ponca City, Okla.
Filed March 19, 1969, Ser. No. 817,228
Int. Cl. A01m *1/20, 1/24*
U.S. Cl. 43—124 11 Claims

An insecticide distribution system and method consisting essentially of a pipe system having an inlet and an outlet and a plurality of nozzles along the pipe. In use, the pipe system is filled with insecticide at the inlet until insecticide is present at the outlet. The outlet is then closed off and the system pressured until the nozzles open at the preset pressure at which time the area near the nozzles will be sprayed with insecticide.



3,676,950
FLATIRON TOY DOLL ACCESSORY
Charles D. Clarke, Redondo Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Nov. 1, 1971, Ser. No. 194,212
Int. Cl. A63h *3/52*
U.S. Cl. 46—14 6 Claims

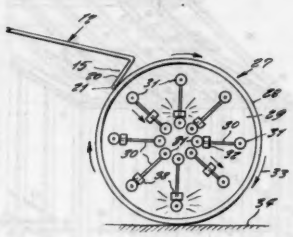


Plastic soleplate is provided with apertures, a red filter above the apertures, a light bulb above the filter and a light-impervious, upstanding side wall to which a handle-carrying, light-impervious cover is affixed. Red light glows through light apertures when bulb is lit to simulate a hot iron. The flatiron is small enough to serve as a doll accessory simulating an iron which would be used by the doll and the iron is also suitable for use by a child-user.

3,676,951
MUSICAL ROLLING HOOP
Bruce Shearer, 5600 Applegate Lane, Louisville, Ky.
Filed Feb. 25, 1971, Ser. No. 118,899
Int. Cl. A63h *5/00*
U.S. Cl. 46—114 1 Claim

An activity toy comprised of a rolling hoop and a push bar for urging the hoop to roll over the ground or a supporting surface, the push bar being made of detachable segments so to be conveniently packaged when being sold, and the hoop in one form comprising a simple circular rim, in another form comprising the circular rim supporting a disc concentrically

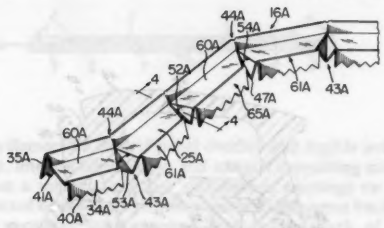
therewithin that is supported by tension springs between the disc and rim, and in a further modified form the hoop being provided with a series of valves and slideable weights which strike the bells as the hoop rotates during travel.



3,676,952
LAWN EDGING DEVICE

Richard M. Watts, Henrico County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Jan. 30, 1970, Ser. No. 7,057
Int. Cl. E01c *11/22*; A01g *1/08*
U.S. Cl. 47—33 7 Claims



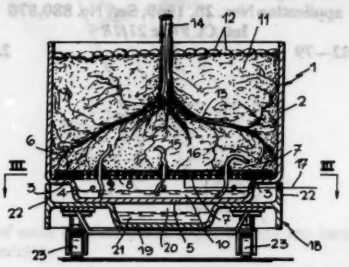
A dual-purpose lawn edging device which serves as a grass stop and a track for a lawn mower wheel. The device has a main strip and at least one side wall extending upwardly from one side edge of the strip with the side wall having a top ridge and an extension which extends downwardly from the ridge to define a supporting leg for the device which is adapted to be embedded in the ground to hold the device in position. The main strip is sufficiently wide to define the track and the side wall serves as a guide for the wheel while allowing easy crossing thereover.

3,676,953
PLANT BOX

Jean Georges Delogne, 8, Place Julien Dillens, Saint Gilles, Belgium

Filed Aug. 31, 1970, Ser. No. 68,090
Claims priority, application Belgium, Sept. 4, 1969, 78.718
Int. Cl. A01g *27/00*
U.S. Cl. 47—38.1 4 Claims

This invention concerns a plant box comprising a container having at a distance from its unperforated bottom a perforated element delimiting with said bottom a drainage chamber containing a quantity of water limited by at least one lateral overflow aperture. This container contains, upon to the perforated element, a mass of mineral substance regularly moistened by wicks conveying water to it by capillary action. The said container rests in a water-tight tray, mounted on rollers, which contains a further quantity of water serving to humidify the air surrounding the plants.



3,676,954
ESCAPE HATCH

Jerry Rapport, Long Beach, and Garold D. Frymire, Buena Park, both of Calif., assignors to Travel Trim & Vent Co., Compton, Calif.

Filed May 13, 1971, Ser. No. 143,002
Int. Cl. E05c *15/02*
U.S. Cl. 49—141 15 Claims

A conventional worm-and-gear operated vent of a recreational vehicle is made operable as an emergency exit by attaching an emergency operating lever that may be rapidly actuated to rotate both the housing of the worm gear drive mechanism and the operating torque shaft that is driven by the mechanism. The housing is rotatably mounted, but normally latched to fix it in position. Operation of the emergency lever achieves both unlatching and rotation of the housing.

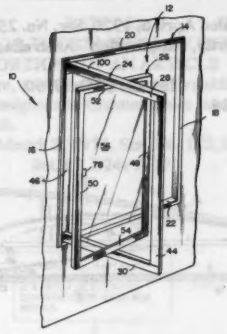
3,676,955
REVERSIBLE CLOSURE

Louis L. Schacht, 205 E. 63rd. St., New York, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,596
Int. Cl. E02d *15/52*
U.S. Cl. 49—192 10 Claims

A reversible closure for a wall opening which includes a rectangularly shaped frame member hingedly affixed to a wall and adapted to swing outwardly from the opening for ventilation or egress purposes. A window sash pivotally mounted within the frame member is rotatable about a vertical axis to provide access to the weather side of the sash for cleaning, etc.

Resilient weatherproofing material placed around the periphery of the window sash is designed to reduce wiping



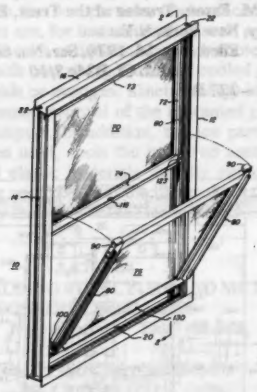
contact with the frame member during rotation of the window sash.

3,676,956

READILY REMOVABLE WINDOW WITH WEATHER-STRIPPING

Henry A. Taylor, York, and Maurice E. Sterner, Jr., Spring Grove, both of Pa., assignors to D. J. Dinsmore Co., Sioux Falls, S. Dak.

Filed June 22, 1971, Ser. No. 155,533
Int. Cl. E05d *13/12*
U.S. Cl. 49—446 **18 Claims**



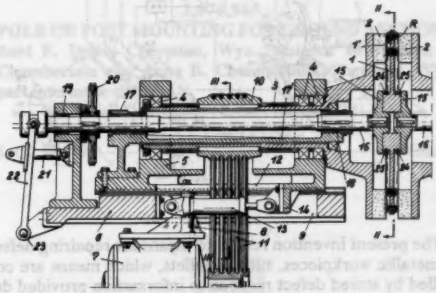
A removable window applicable to single or plural hung sash designs and particularly to metallic construction. The window includes a casing having jamb channels in which are positioned balance assemblies to be rigidly positioned therein with respect to translational or longitudinal movement. The sash rides on the surface of the balance assembly through guide members which are deformable and the opposite edges of the sash include lower guides which are positioned in the jamb channels remote from the balance assemblies to be guided therein. The sash cords of the balance assemblies have hooks which ride beneath the lower guide means on the sash which hook is turned with pivoting of the sash on the lower guides to lock the sash cords in position in the jamb channels as the window is removed. The sash are removed by pivoting the window away from the balance assemblies through the deformable guide means at the upper edge and tilting the sash to release the lower guides from the jamb channels. Weather-stripping on the window casing and on the sash seal the edges of the sash and the tops and bottoms of the same to provide an airtight window assembly.

3,676,957

SPRING GRINDING MACHINES

Jacques Pierre Albert Herckelbout, Paris, France, assignor to Herckelbout Et Fils, Rosny sous Bois, France

Filed April 22, 1970, Ser. No. 30,691
Claims priority, application France, April 25, 1969, 6913219
Int. Cl. B24b *7/16*
U.S. Cl. 51—118 **5 Claims**



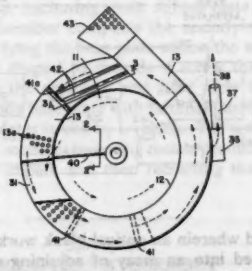
The present invention concerns a machine for grinding helicoid springs which simultaneously permits all the springs to be ground, carried by a magazine-plate which is circular, rotary and removable, to the abrasive action of two grindstones while ensuring a uniform wear of the latter.

3,676,958

VIBRATORY CLEANER

Carl C. Garland, Detroit, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

Filed Nov. 9, 1970, Ser. No. 88,052
Int. Cl. B24b *31/06*
U.S. Cl. 51—163 **10 Claims**



Apparatus and means are provided for cleaning pharmaceutical capsules by vibration in mixing contact with granular cleaning agent while moving the capsules away from the cleaning zone free of cleaning agent.

3,676,959

APPARATUS FOR REPAIRING DEFECTS IN METALLIC WORKPIECES BY AUTOMATIC MEANS

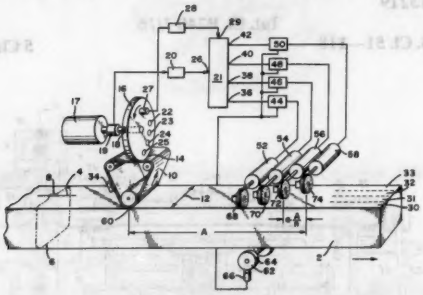
Freiderich M. O. Forster, Grathwohlstrasse 4, Reutlingen, Germany

Filed June 29, 1970, Ser. No. 50,458

Claims priority, application Germany, Sept. 13, 1969, P 19 46 510.2

Int. Cl. B24b *49/04*

U.S. Cl. 51—165 R 5 Claims



The present invention relates to means for repairing defects in metallic workpieces, such as billets, which means are controlled by stored defect responsive information provided during the nondestructive test process. The nondestructive test apparatus provides defect responsive signals which are recorded and stored by storage means and subsequently recalled from the storage means for actuating defect repair means, such as a grinding wheel, engaging the workpiece at the defect location.

3,676,960

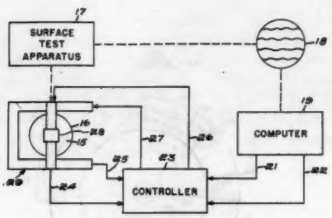
OPTICAL SURFACE GENERATING APPARATUS

Ronald Aspden, Bedford, Mass., assignor to Itek Corporation, Lexington, Mass.

Division of Ser. No. 719,657, April 8, 1968, Pat. No. 3,587,195. This application May 25, 1970, Ser. No. 50,012

Int. Cl. B24b *49/02*

U.S. Cl. 51—165.71 7 Claims



A method wherein an optical blank work surface is figuratively divided into an array of adjoining surface areas and measured to determine the total relative number of uniformly sized blank material decrements that are required in each surface area to produce a desired surface contour. An optical lap moving across the work surface in an irregular continuous path produces one of the uniform decrements upon each traversal across an individual surface area. The lap is controlled such that its travel path exhibits a preference for movement from an occupied area to adjacent areas still requiring the greatest number of material decrements.

3,676,961

KNIFE SCABBARD OR HOLDER

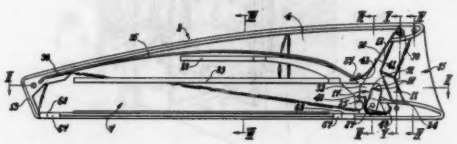
Dennis B. Jackson, Nunawading, Victoria, Australia, assignor to Wiltshire Cutlery Company Proprietary Limited, Australia

Filed April 6, 1970, Ser. No. 25,881

Claims priority, application Australia, May 7, 1969, 54616/69

Int. Cl. B26b *11/00*

U.S. Cl. 51—214 26 Claims



A scabbard for receiving and protecting the blade of a knife and including a device which functions to sharpen the cutting edge of the blade as the blade is inserted into and withdrawn from the scabbard. The sharpening device is pivotally mounted so as to present a respective sharpening edge according to the direction of longitudinal movement of the blade relative to that device, and a cushion spring bears on the sharpening device to limit the pressure acting between the knife blade and the sharpening device, during the sharpening operation. Means is also provided to normally urge the knife blade into engagement with the sharpening device.

3,676,962

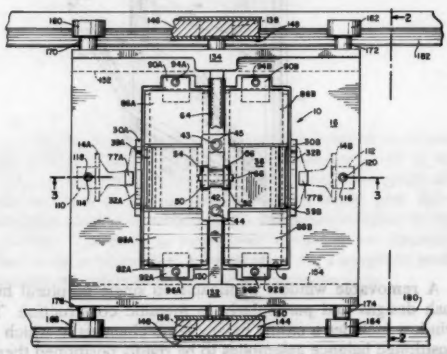
APPARATUS FOR ORNAMENTING GLASS ARTICLES

Charles Edward Stevens, East Grand Rapids, Mich., assignor to John M. Exton, Trustee of the Trust, Exton Development Company, New York, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,467

Int. Cl. B24c *3/10*

U.S. Cl. 51—227 R 9 Claims



Apparatus for ornamenting glass articles by abrasive blasting techniques comprises an article holding and masking arrangement useful for the mass production of ornamented glass tumblers of high quality. The glass tumblers are clamped within the article holder which includes mounting members for supporting the interior and exterior surfaces of the tumbler. Clamping pressure is applied to the exterior surface of the tumbler so that a mask can be applied with considerable force to an opposite portion of the exterior surface. The construction is such that during the process there is little or no relative displacement between the tumbler and the article

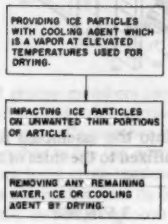
holder. Consequently, after a first design has been blasted into the glass, a second mask can be applied to the article in accurate registry with the design formed through the first mask.

3,676,963

METHOD FOR THE REMOVAL OF UNWANTED PORTIONS OF AN ARTICLE

Edwin Eugene Rice, and Charles Henry Franklin, both of Ann Arbor, Mich., assignors to Chemotronics International, Inc., Ann Arbor, Mich.

Filed March 8, 1971, Ser. No. 122,152
Int. Cl. B24c *1/00*
U.S. Cl. 51—320 10 Claims


PROVIDING ICE PARTICLES WITH COOLING AGENT WHICH IS A VAPOR AT ELEVATED TEMPERATURES USED FOR DRYING.
STEP 1
IMPACTING ICE PARTICLES ON UNWANTED THIN PORTIONS OF ARTICLE.
STEP 2
REMOVING ANY REMAINING WATER, ICE OR COOLING AGENT BY DRYING.
STEP 3

A method for the removal of unwanted portions of an article such as burrs and flashing utilizing solid particles of ice which are impacted against the unwanted portions is described. The ice particles are maintained in a flowable condition prior to impact by a cooling agent. The cooling agent is in a heat transfer relationship with the ice particles, usually in direct contact with them. Examples of cooling agents which can be mixed with the ice particles and which are easily removed with them are, for instance, solids such as solid carbon dioxide, liquids such as liquid nitrogen or cooled alkanols and/or lower alkanols containing water and cooled gases such as air, carbon dioxide or nitrogen. Kinetic energy imparted to the ice particles causes removal of the unwanted portions of the article upon impact. In addition, the ice particles, and cooling agent when used, cools the impacted area and with thermoplastic and elastic materials thereby embrittles thin sections of flashing and burrs and the like making them more easily removable by the impact of the ice particles.

3,676,964

FRAME AND BUILDING STRUCTURE AND METHOD OF CONSTRUCTING SAME

Carlos Anglade, Jr., Apartado Este 80.084, Caracas, Venezuela

Filed Dec. 29, 1969, Ser. No. 888,495
Int. Cl. E04b *1/32*
U.S. Cl. 52—86 21 Claims

A skeleton frame for a building comprises a series of long span arches made up of straight bars joined at their ends. Successive arches are staggered such that the corresponding bars of alternate arches are parallel, and with this relation, each joint between arch bars is connected to all adjacent joints by diagonal struts. Alternate arches of both sets are tied by cross-members extending perpendicularly to the planes of the arches. The complete building is enclosed by sheet material carried by the cross-members and curved in conformity with the arches.

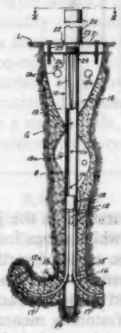
In constructing the frame, the bars making up several arches are laid out flat on the ground, with the struts, and are loosely connected. The structure is then lifted up, as by hoisting at selected points, until it is arch-shaped, and is then secured to ground supports at its free ends. The joints are tightened, and successive arches are added, as by loosely assembling them in further groups on the ground and raising the groups in succession as before.

3,676,965

POLE OR POST MOUNTING FOR GROUND ANCHOR

Robert F. Delke, Cheyenne, Wyo., assignor to William H. Chamberlain and Anna B. Chamberlain, Cheyenne, Wyo., part interest to each

Filed Oct. 15, 1970, Ser. No. 80,894
Int. Cl. E02d *27/42*
U.S. Cl. 52—98 9 Claims



A ground anchor for posts, poles and the like having a base plate assembly accommodating pitch or tilt adjustment of the pole or post relative to the anchor and adapted to yield and break away when the pole or post is subjected to a lateral impact force of a predetermined magnitude. The anchor has a pile member driven into the ground carrying tentacles which are ejected to form anchoring roots. A base plate at the upper end of the pile member compacts the underlying earth and rigid vanes underlying the base plate stiffen the assembly and may be helically shaped to provide a screw thread locking relationship with the earth. A post base plate is adjustably anchored to the pile base plate with fasteners that can yield or break when the post is struck by a vehicle. The post may be attached to the pile member by spring means permitting the post to deflect under impact and then retracting the post to an upright position.

3,676,966

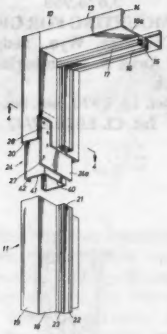
DOOR-FRAME ASSEMBLY

Douglas Ragland, Houston, Tex., assignor to Ragland Manufacturing and Construction Company, Houston, Tex.

Filed Dec. 29, 1969, Ser. No. 888,571
Int. Cl. E06b *1/14*
U.S. Cl. 52—211 20 Claims

A door-frame assembly for mounting in the door opening of a wall wherein the weight of the door mounted thereon is carried on concealed support members rather than the jambs. The assembly has a pair of rigid support members mounted on

either side of the door. In the preferred case, plates, secured to the support members, face the door opening and are spaced generally such that the hinges of the door can be fastened directly thereto through openings in the jambs. The jambs can be of the double rabbet type including door stops having a channel facing the door opening and which contain apertures through which screws or other fastening means can be placed to secure the jambs to the plates. The channel is provided with a snap-in, flexible insert such that the fastening means are concealed. The door stop can also have a channel which faces the door side of the assembly and in which is carried a flexible insert to act as a weather seal or gasket. The header section, which serves also to space the support members, can be of



either the same configuration as the jambs or can be comprised of a fascia strip which snaps into a partition cap. The support members can be adjusted vertically to accommodate various door height openings. This is accomplished by means of vertical slots located close to each end of the support through which extend fastening means which are slidable in the slots and adjustably tightenable in lower or upper brackets mounted on the floor or wall supporting members respectively. The sides of the jambs which embrace respective sides of the wall adjacent the door openings are equipped with inturned legs which engage the wall surfaces and which contain longitudinal passageways into which can be inserted dowel pins to allow for splicing thereof.

3,676,967

FORMS FOR CONCRETE WALL CONSTRUCTION

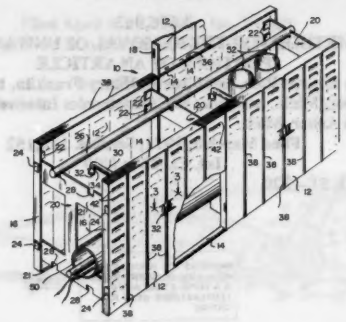
Augustus Frati, 95 Greenlawn Road, Greenlawn, N.Y.

Filed July 1, 1970, Ser. No. 51,523

Int. Cl. E04b *2/68*; E04f *17/08*

U.S. Cl. 52—220 **16 Claims**

Rectangular sheets of galvanized metal pans are assembled to construct wall forms at the construction site. Each pan includes inwardly bent flanges along its peripheral edges. A course of several pans is erected by joining a horizontal row of pans along abutting vertical side flanges. Several courses are stacked in a vertical plane to construct one face of a wall form. The other face of the form is constructed of similar pans in spaced parallel relationship to the first face. The abutting edges of the pans are either welded or joined by connector plates. A plurality of spaced vertical ribs project outwardly from the face of each pan. The ribs provide contiguous coplanar surfaces against which sheet wall covering may be mounted. Spaced between the ribs are columns of louvers which serve as a lath if the wall is plastered. A further option is the use of an insulation panel, nestably received on the inside face of each pan between the peripheral edges thereof.



Concrete is poured into the assembled form and the forms remain permanently affixed to the sides of the concrete core.

3,676,968

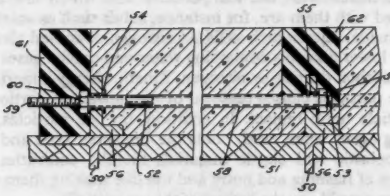
STRESSED CONCRETE STRUCTURES AND METHOD OF MAKING

Henry Fred Campbell, Belleville, Mich., assignor to Campbell Research Corporation, Detroit, Mich.

Filed June 1, 1970, Ser. No. 41,935

Int. Cl. E04c *3/10, 3/26*

U.S. Cl. 52—223 R **6 Claims**



A prestressed concrete structure wherein a body of set concrete has at least one reinforcing rod therein. One end of the rod is restrained and the other end of the rod has abutment means thereon. The length of the rod between the abutment means and the restrained end is of predetermined magnitude. After the concrete is set, the rod is heated so that it expands longitudinally permitting a spacer of predetermined length to be inserted between the abutment of the rod and the concrete thereby producing a predetermined stress on the rod.

3,676,969

LOG TYPE BUILDING UNIT

Dan B. Moore, 445 13th Ave., Huntington, W. Va.

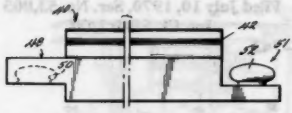
Filed April 3, 1970, Ser. No. 25,394

Int. Cl. E04b *1/10*; A63h *33/08*

U.S. Cl. 52—233 **9 Claims**

A basic building log or member from which a building with a number of abutting walls can be formed. Each basic log has a first ledge portion at one end of its length, a second ledge portion at the other end of its length for mating with the first ledge portion of a member in an abutting wall, a tongue portion extending along the length of the log on one side thereof from one ledge portion to the other and grooves opening on the side

opposite the side of the basic unit with the tongue portion for receiving the tongue portion of another member in the same wall. Preferably, the basic member is used with a number of sill members which form the base of the structure and which have a tongue portion but no groove and with a number of cap members which are provided with a groove but are flat on the other side which forms the top of each of the abutting walls. If



desired, tongue and groove members can be provided respectively on the first and second ledge portions for further locking the members in abutting walls together or the surfaces can be inclined to mate together to lap the corners. Preferably, each of the tongue portions has a cross-sectional dimension near its top which exceeds a dimension near its bottom so that tongue portions snap into the associated groove portions to lock the members together.

3,676,970

FILED SURFACE AND METHOD OF APPLICATION

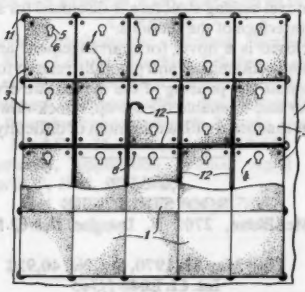
Frederick James Edwards, Northumberland, England, assignor to Thermal Syndicate Limited, Northumberland, England

Filed April 15, 1970, Ser. No. 28,632

Claims priority, application Great Britain, April 24, 1969, 20,926/69

Int. Cl. E04f *13/14*

U.S. Cl. 52—385 **6 Claims**



The invention relates to a cladding panel for a building and a method of attaching such a cladding panel to a building. The cladding panel, made of vitreous silica or a glass having a SiO_2 content of greater than 95 percent, is provided with at least one integrally formed projection made of the same material as the rest of the panel, the projection, or each projection having a dove-tailed cross-section in a plane normal to the rear surface of the panel.

The method and apparatus further a backing sheet attached to the building and which locks the projection into a keyhole recess formed in the backing sheet to sandwich an adhesive composition between the panel and the sheet.

3,676,971

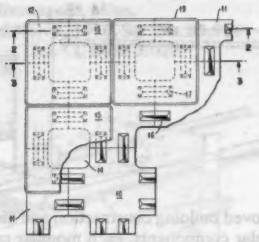
TILE STRUCTURE WITH CRUCIFORM SHAPED FOUNDATION SUPPORTING TILES

Edward L. Dombroski, 16 Catskell Ave., Poughkeepsie, N.Y.

Filed Nov. 14, 1969, Ser. No. 876,871

Int. Cl. E04c *1/10*; E04f *13/08*

U.S. Cl. 52—603 **2 Claims**



A tile walk or patio in which a plurality of cruciform foundation tiles are laid in a layer without cement with their arms forming drainage sumps; a plurality of surface tiles are then laid on the foundation layer without cement, the surface tiles each overlapping a plurality of foundation tiles and sumps. The foundation tiles are formed with tenons or bosses on their upper surfaces that co-operate, with mortices or sockets formed in the under surface of the surface tiles, to lock the surface tiles from horizontal displacement from the foundation layer and to guide a surface tile, displaced vertically by ice, back to its initial position as the ice melts.

3,676,972

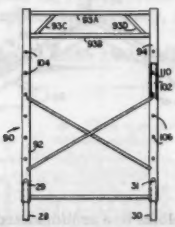
SHORING STRUCTURE

Clayton R. Ballou, San Ramon, Calif., assignor to Jack E. Hursh, Millbrae, Calif., a part interest

Filed Aug. 1, 1969, Ser. No. 846,759

Int. Cl. E04h *12/00*

U.S. Cl. 52—638 **3 Claims**



Disclosed herein are shorting structures having bases and telescoping members, each shoring structure being fabricated of square tubing. In one embodiment of the structure, square tubing of the telescoping member telescopes inside and along square tubing of the base. In a second embodiment, square tubing of the telescoping member telescopes outside and along square tubing of the base member. In yet another embodiment both inner and outer square tubing of the telescoping member telescopes along square tubing of the base.

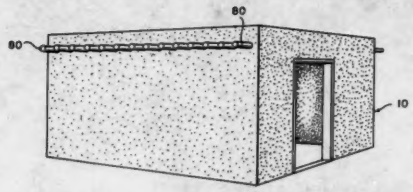
Lock means are associated with the bases and telescoping members to lock thereto cross bracing between base members, telescoping members, etc. Such lock means include a slidable member which is slidable to a position holding the end portion of a cross brace, and to a position freeing the end portion of the cross brace.

3,676,973

MODULAR BUILDING CONSTRUCTION AND METHOD

Paul H. Kellert, Rural Rte #1, Mannford, Okla.

Filed July 6, 1970, Ser. No. 52,610
Int. Cl. E04b 1/04, 2/72
U.S. Cl. 52—262 5 Claims



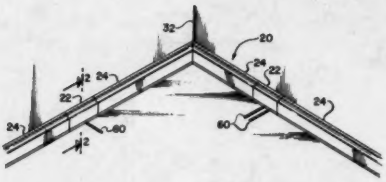
An improved building construction and method of assembly from modular components, each modular component including (as erected) a pair of parallel horizontal Tee channels with the legs of the Tees facing each other, two or more vertical steel pipes suitably slotted and connected at their ends to the legs of the Tee channels, panels of lightweight plastic insulation filling the rectangular spaces formed by the foregoing members and suitably slotted to be received over the legs of the Tee channels, reinforcing wire screen surrounding the pipe sections and both surfaces of the insulation panels and a layer of concrete gunned onto both sides of the insulation material against the wire screens and level with the screed line formed by the outer edges of the Tee channels.

3,676,974

BASEBOARD MOLDING INCORPORATING COVER SECTIONS FOR CONCEALING ELECTRICAL WALL OUTLET RECEPTACLES

John L. Daly, 2256 Morris Ave., Bronx, N.Y.

Filed June 22, 1970, Ser. No. 48,276
Int. Cl. E04f 17/08, 19/04
U.S. Cl. 52—716 8 Claims



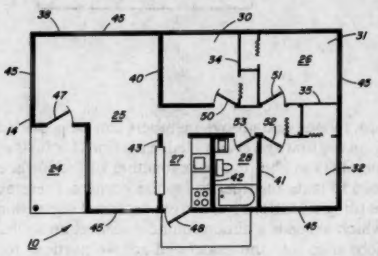
The disclosure relates to a sectionalized baseboard molding including sections adapted to be placed over and to thereby conceal electrical wall outlet receptacles and corresponding plug connectors. A hollow removable cover section of molding is positioned over the electrical wall outlet receptacle and is pivotally mounted to adjacent fixed sections of molding to permit rotational displacement of the cover section for insertion and withdrawal of a plug connector. The cover section of molding is spring biased to return to its original position adjacent the wall surface and in one embodiment is so retained by a detent locking arrangement. The pivotal mounting is located at the top of the cover section of molding in one embodiment and at the foot of the cover section of molding in the other embodiment. A third embodiment employs hanger rods extending outwardly from adjacent fixed sections of molding. The cover section of molding in this embodiment can be completely removed for permitting insertion or removal of the plug connector into the outlet receptacle and for this purpose has slotted openings which fit over and engage the hanger rods to thereby support the cover section of molding. All the embodiments utilize a layer of foam material affixed to the bottom edge of the molding for allowing passage of the electrical wire conductors thereunder.

3,676,975

APPARATUS FOR THE CONSTRUCTION OF CONCRETE STRUCTURES

Anthony W. Belluscio, 1611 E. Elizabeth Ave., Linden, N.J.

Filed July 10, 1970, Ser. No. 53,803
Int. Cl. E04b 1/00
U.S. Cl. 52—743 5 Claims



A concrete structure, e. g. a dwelling house, is disclosed to include a base slab, a monolithic divider slab for defining an outside wall and a plurality of interior walls, and a concrete roof. The monolithic divider slab encases conduits for providing electrical service and suitable piping means for providing plumbing services.

The structure is disclosed to be constructed by pouring a base slab on the desired site, erecting a form on the base slab after curing to define an opening for concrete for the monolithic divider slab, filling the opening so defined with concrete and allowing it to cure, removing the forms and positioning a pre-cast concrete roof on and in secure engagement with the monolithic divider slab. The roof may be poured conveniently adjacent the base slab site and thereafter lifted into position on the monolithic divider slab. Where the roof is in sections, a novel sealing structure is disclosed for securing the joint at the interface of the sections.

Also disclosed is a novel form arrangement and structure which utilizes sectionalized and pivotally related form sections to accommodate the pouring of the monolithic divider slab as a single pour and to enable the set-up, knock-down and transportation of the forms with a minimum of difficulty.

3,676,976

ROOF STRUCTURE

Jack G. McAllister, 2701 N. Douglas Drive, Minneapolis, Minn.

Filed May 27, 1970, Ser. No. 40,922
Int. Cl. E04b 1/345
U.S. Cl. 52—747 16 Claims

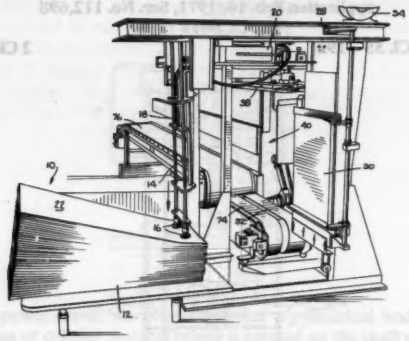
An arcuate roof structure formed by interlocking building units, subassemblies, modules, components, blocks and the like together including the method of raising of the roof structure to a usable position.

3,676,977

BAG APPLICATOR METHOD AND APPARATUS

Harry Edward Rothmann, Valhalla, and Walter Ruf, Spring Valley, both of N.Y., assignors to St. Regis Paper Company, New York, N.Y.

Filed Sept. 17, 1970, Ser. No. 73,034
Int. Cl. B65b 1/22
U.S. Cl. 53—24 14 Claims



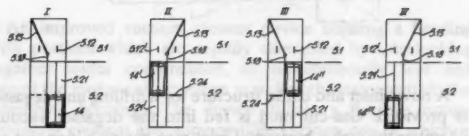
This invention relates to a method and apparatus for applying bags to a bag filling machine and is characterized by apparatus for picking up a single bag from a stack of empty bags and positioning and holding the empty bag in a preselected position, and then transporting the bag to a bag opening and filling station wherein the sides of the bags are collapsed to cause the front and rear faces of the bag to buckle, and then they are pulled outwardly and a filling spout is introduced into the bag for discharging a quantity of material while means for settling and compacting the material in the bag are operating, and thereafter the bottom of the bag is elevated, and the bag is transported to a bag closing and sealing device.

3,676,978

APPARATUS FOR PACKING BAGS IN BOXES OR CARTONS

Gert Gottweis, Wiederitzsch; Michael Herrlich, Leipzig; Gunther Klas, Leipzig; Joachim Schober, Leipzig; Peter Thiede, Leipzig, and Eberhard Zachaus, Leipzig, all of Germany, assignors to Ingenieurburo fur Rationalisierung der Suss- und Dauerbackwarenindustrie, Leipzig, Germany

Filed Feb. 26, 1970, Ser. No. 14,448
Claims priority, application France, April 28, 1969, 2041528; April 28, 1969, 6913506
Int. Cl. B65b 5/10; B65g 57/06
U.S. Cl. 53—59 R 6 Claims



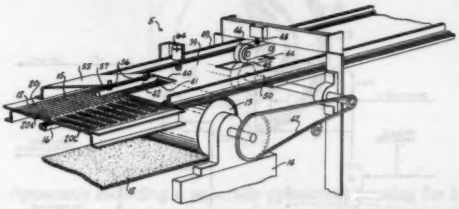
A method and apparatus for packing in cartons bags containing loose, generally solid, small articles, closing, sorting and palleting the cartons, wherein the cartons are erected from flat blanks, moved to a packing station, held to receive the filled bags which are delivered successively to a plurality of predetermined stack positions, the filled cartons being advanced to a labeling station, carton closing station, inspection and sorting station and held on one or more storage tracks or a "reject" track, the stored non-rejected cartons being then stacked as required on pallets and all the foregoing steps being carried out by apparatus designed to operate continuously and cooperatively, with the virtual elimination of manual work.

3,676,979

SUBSTRATE TRANSPORT MEANS FOR SKIN PACKAGING MACHINES

Thomas L. Schuette, Osseo, Minn., assignor to Possis Machine Corporation, Minneapolis, Minn.

Filed Nov. 2, 1970, Ser. No. 85,914
Int. Cl. B65b 35/28
U.S. Cl. 53—112 A 14 Claims



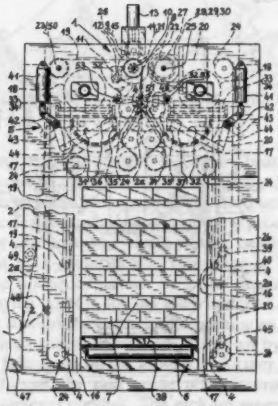
A flat apertured endless belt has an upper stretch riding on air intake grills. Its apertures register with the air intakes to apply suction to the underside of substrate on it. Substrate lengths are impositively driven toward said stretch, faster than it moves, along a feed table having its top surface parallel to but above that of said stretch. Downstream from the table a hold down finger forces the medial portion of each substrate length into tractive engagement with the belt while its side edge portions are supported by rails coplanar with the table top, bowing it to an upwardly concave transverse curvature which insures that the length behind it will edgewise abut it.

3,676,980

APPARATUS FOR WRAPPING BULKY OR STACKED OBJECTS

Walter Engelhardt, Stuttgart, and Bruno Friedrich Bernhardt, Reutlingen-Betzingen, both of Germany, assignors to Carl Drohmann Gesellschaft mit beschrankter Haftung, Stuttgart-bad Connstatt, Germany

Filed June 12, 1970, Ser. No. 45,781
Claims priority, application Germany, June 16, 1969, P 19 30 468.8
Int. Cl. B65b 1/02, 43/30
U.S. Cl. 53—183 7 Claims



An apparatus for wrapping bulky objects, or objects stacked on pallets, by which a continuous length of flattened foil tub-

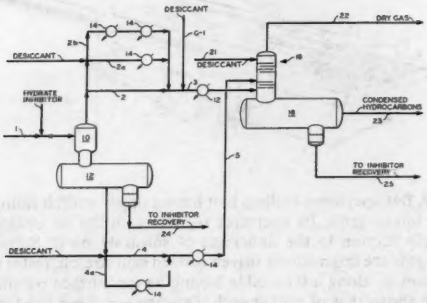
ing is positively gripped at its leading end, is opened out, and this open end is drawn down over the objects to envelop them, whereafter jaws are brought into action automatically to seal and sever the section of enwrapping foil from the parent stock.

3,676,981

TREATMENT OF HYDROCARBON GASES

Ronald L. Afdahl, and Harold W. Barber, both of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Feb. 24, 1971, Ser. No. 118,411
Int. Cl. B01d *53/14*
U.S. Cl. 55—30 **10 Claims**



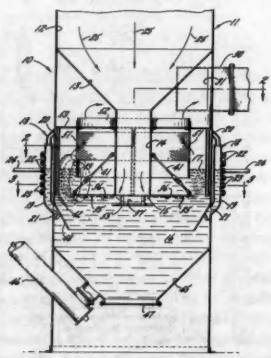
A process for treating hydrocarbon streams comprising methane, ethane and higher boiling fractions which comprises separating the stream into vapor and liquid components; separately cooling the vapor and liquid components; adding to the vapor stream prior to the ultimate cooling stage a desiccant material; and recontacting the chilled liquid and vapor streams in a contact zone. The described process enhances the quality of the separated vapor stream and the recovery of gas hydrate inhibitor chemicals from hydrocarbon gas stream under superatmospheric conditions to which such inhibitor chemicals have been added to inhibit formation of gas hydrates.

3,676,982

METHOD AND APPARATUS FOR SCRUBBING GASES

Franklin Carr Price, 33 W. 16th St., Chicago Heights, Ill.

Filed Aug. 14, 1970, Ser. No. 63,681
Int. Cl. B01d *47/02*
U.S. Cl. 55—95 **8 Claims**



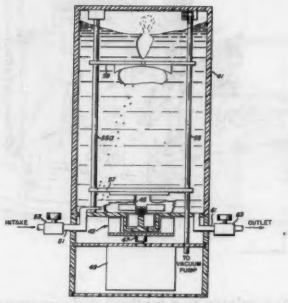
A method and apparatus for efficiently scrubbing gases in which gas is discharged into a body of liquid and forced beneath a flat distributor plate disposed well within the liquid. The gas volumetric radial flow rate and liquid head causes a thin, high velocity gas stream to be developed giving a high scrubbing and reaction efficiency.

3,676,983

APPARATUS AND METHOD FOR DEGASSING A LIQUID

Walter E. Nold, 24 Birch Road, Natick, Mass.

Continuation-in-part of Ser. No. 59,110, July 29, 1970. This application Feb. 14, 1971, Ser. No. 112,698
Int. Cl. B01d *19/00*
U.S. Cl. 55—192 **2 Claims**



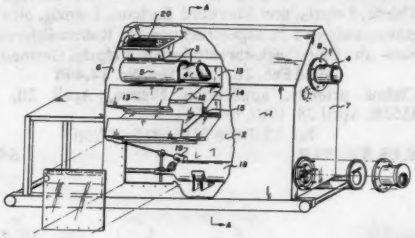
Apparatus and method for removing entrapped gases from liquids by, simultaneously, mechanically agitating the liquid to be processed and drawing a partial vacuum over the free surface of such liquid.

3,676,984

DRILLING MUD DEGASSER

Joseph Edwin Clark, 3132 10th St., N.W., Calgary, Alberta, Canada

Filed Oct. 22, 1970, Ser. No. 83,093
Int. Cl. B01d *19/00*
U.S. Cl. 55—193 **2 Claims**

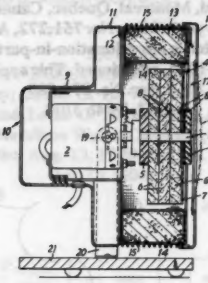


A novel inlet and baffle structure for a drilling and degasser is provided. Gas-cut mud is fed into the degasser vacuum chamber through a horizontal inlet pipe having a long slot cut in its bottom wall. The mud flow is formed into a thin curtain as it passes through this slot. At the same time, its rate of movement is accelerated, with a consequent increase in shear and drop in viscosity. The mud immediately contacts a generally horizontal baffle. The flow is divided into two turbulent, thin layers. It is then conducted through a system of baffles. Due to the change in mud viscosity, induced turbulence and the forming of the mud flow into thin layers of large area, the vacuum within the chamber is able to effectively separate the entrained gas from the mud.

3,676,985
POWER-DRIVEN AIR FILTER

Christopher Roy Foreman, London, and Patricia Violet Shipman, Whitton, both of England, assignors to Patent Protection Limited

Filed June 4, 1970, Ser. No. 43,451
Int. Cl. B01d 45/12
U.S. Cl. 55—317 5 Claims

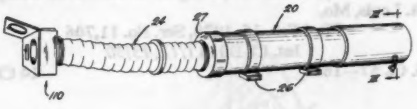


A power-driven air filter comprises a cylindrical body of fibrous or cellular material which is rotated on the shaft of an electric motor to cause contaminated air to be drawn into the front and rear faces of the body and pass through the fibrous or cellular material and so be filtered. The rotary body may be formed as a series of readily replaceable face-to-face discs, held on the shaft by push fit retaining members; and an outermost one of the discs is thinner than at least one other of said discs, with the thinner disc being discarded and replaced, when contaminated, in advance of others of said discs. An annular secondary filter in the form of an agglomeration of activated carbon may be arranged around the rotary body.

3,676,986
BUILT-IN CENTRAL VACUUMING DEVICE

Joseph W. Relling, Battle Creek, Mich., assignor to Charles Woods, Delton, Mich.

Filed Sept. 15, 1969, Ser. No. 858,079
Int. Cl. B01d 46/02
U.S. Cl. 55—472 17 Claims

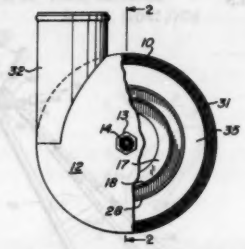


An improved vacuum cleaner device utilizing a housing with portions which are rapidly assembled by interlocking together under compression, to simultaneously seat and mount the motor and impellers as well as the stators within the assembled housings. The device utilizes a flexible motor-mounting element and compressible O-rings, one of which is positioned between the two telescoping housings to provide an air seal as well as axial resilience helping to retain the parts in their assembled state. A similarly interlocking cylindrical extension is provided for use in enlarging the housing to accommodate a larger motor. A wall-mounted receptacle for access to the vacuum from the interior of the habitation has a front cover plate attached to the receptacle by a living hinge, and the entire receptacle can be molded in one piece, so as to bias the cover plate in its fully opened position by the molding orientation of the living hinge.

3,676,987
WATER SEPARATOR

John E. Wunder, Dayton, and Anson S. Coolidge, Centerville, both of Ohio, assignors to United Aircraft Products, Inc., Dayton, Ohio

Filed July 27, 1970, Ser. No. 58,279
Int. Cl. B04c 5/04
U.S. Cl. 55—459 8 Claims

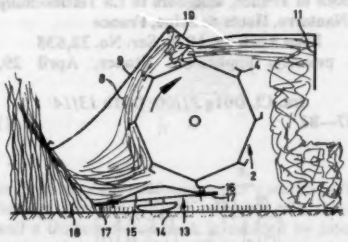


Apparatus including a generally cylindrical housing for interposing in a flowing stream of gaseous fluid. Within the housing, a portion of the inflowing gaseous fluid stream is subjected to hydrocyclonic action and separated liquid is discharged through one end of the housing. Another portion of the inflowing stream is subjected to circuitous flow within the housing and in a portion of the circuitous path is a coalescing means. Inherently separated liquid from the other portion moves to a collection chamber and discharges through a liquid outlet at the other end of the housing.

3,676,988
HAY-MAKING MACHINE

Hans Ulrich Hauser-Lienhard, Zurich, Switzerland, assignor to Bucher-Guyer A.G. Maschinenfabrik, Niederweningen, Zurich, Switzerland

Filed Jan. 30, 1970, Ser. No. 7,086
Claims priority, application Switzerland, Jan. 31, 1969, 1535/69
Int. Cl. A01d 43/00
U.S. Cl. 56—1 6 Claims



A hay-making machine comprises a rotary beating drum or drums provided with beater bars for subjecting the cut grass and stalk material to a beating, crushing and buckling action in order to accelerate the consecutive drying process. Rotary pick-up means are arranged ahead of the beating drum to deliver the cut stalk material into the range of the beating drum. A guide plate cooperates with the beating drum to define a conveying conduit for the stalk material. The end of the guide plate is provided with a baffle forming an impact surface against which the stalk material is thrown by the beater drum before it falls again on the ground. A further impact surface may be formed by said guide plate intermediate the length of the conveyer conduit. The pick-up means may be a rotary member provided with prongs for picking up the cut stalk material from the ground, or it may be combined with a disc-type or gyratory mower arranged ahead of the beating

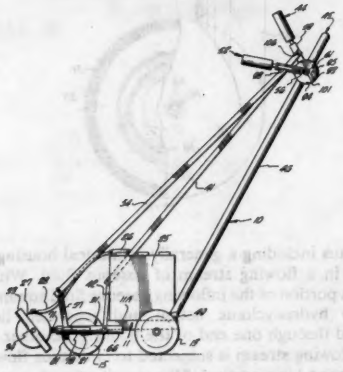
drum for cutting and at the same time picking up the stalk material.

3,676,989

ELECTRIC GRASS EDGER

John W. Slayton, 2148 Stanford Ave., Pomona, Calif.

Filed March 15, 1971, Ser. No. 124,167
Int. Cl. A01g 3/06
U.S. Cl. 56—10.5 6 Claims



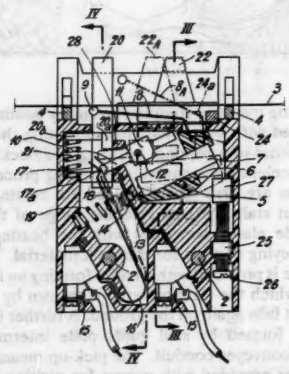
A pusher-handle attaches to a frame which supports a battery and has a rear wheel pair and a vertically articulated front wheel pair to change the height of a cutter blade driven by a DC series-wound motor supported from the frame. The motor is displaceable angularly with respect to the frame by means of a rectangle of interconnecting telescoping and turning links. Controls at the handle set the height of the motor and the blade and set the tilt of the blade. The controls are locked by threaded members which thrust against clutch plates. The battery has a keyed switch.

3,676,990

THREAD-SENSING DEVICE FOR A TEXTILE MACHINE

Fernand Santerre, Yvelines, and Francis Libaud, Hauts-de-Seine, both of France, assignors to La Telemecanique Electrique, Nanterre, Hauts de Seine, France

Filed April 28, 1970, Ser. No. 32,635
Claims priority, application France, April 29, 1969, 6913611
Int. Cl. D01g 31/00; D01h 13/14
U.S. Cl. 57—81 11 Claims



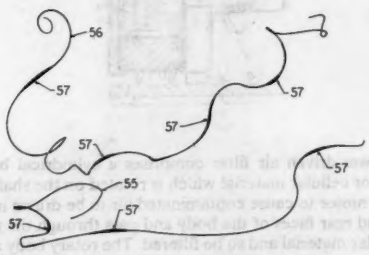
A thread sensing device has contacts suitable to pass currents for operating thread cutters and the like, which contacts are held apart by a ferromagnetic latch. A thread sensor is coupled to a permanent magnet which is moved when thread breakage occurs to bring the magnet into a position in which it acts on the latch to release the contacts.

3,676,991

CRIMPED DISCONTINUOUS FILAMENTS

Hugh J. Fairfield, Galt, Ontario, Canada, assignor to Du Pont of Canada Limited, Montreal, Quebec, Canada

Continuation-in-part of Ser. No. 751,272, Aug. 8, 1968, abandoned, which is a continuation-in-part of Ser. No. 597,263, Nov. 28, 1966, abandoned. This application Nov. 6, 1969, Ser. No. 874,589
Int. Cl. D04h 5/00
U.S. Cl. 57—140 R 11 Claims



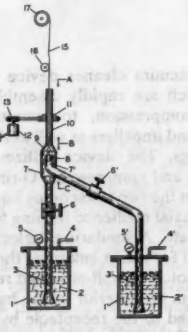
A method of converting a mass of textile filaments in the form of textile material waste, tangled thread waste or cold-drawable continuous filaments of a synthetic polymer, to a useful product by forwarding the mass at a low speed under a restrained condition, while withdrawing the mass at a high speed to separate, randomly stretch and cool the filaments. The filaments are then collected. When the initial material is undrawn cold-drawable continuous filaments of a synthetic polymer, the resulting product is a mass of novel discontinuous drawn filaments having variable lengths, undrawn segments randomly spaced along the lengths, and crimps in the filaments in random directions spaced randomly along the lengths.

3,676,992

FLUID SPINNING PROCESS FOR NOVEL YARNS

Myrne R. Riley, Rolla, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 16, 1970, Ser. No. 11,706
Int. Cl. D01h 1/12, 13/30
U.S. Cl. 57—164 14 Claims



A fluid vortex spinning process for yarns in which a dispersion of high modulus refractory fibers in a viscous carrier

liquid is introduced as a flowing stream into a flowing stream of a dispersion of lower modulus fibers in a viscous carrier liquid at the center thereof and the joined stream is rotated about its axis to produce a composite yarn. Composite staple fiber core yarns with a core of compact axially aligned high modulus fibers wrapped by annular lower modulus fibers are embraced, as well as an improved fluid vortex spinning apparatus affording a high degree of control of the properties of composite yarns produced therewith.

3,676,993

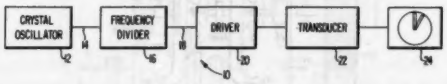
ELECTRONIC WATCH

John M. Bergey; James O. Le Van; Richard S. Walton, all of Lancaster, and Louis G. Brethauer, Landisville, all of Pa., assignors to Hamilton Watch Company, Lancaster, Pa.

Filed Aug. 13, 1970, Ser. No. 63,390

Int. Cl. G04c 3/04

U.S. Cl. 58—23 **27 Claims**



Disclosed is an electronic wristwatch in which a crystal oscillator drives an electromechanical resonator tuned to the oscillator output. The high frequency oscillator is connected through an integrated circuit divider and driver to the resonator coil so that the coil oscillations are slaved to the frequency of the divider output. A lever, rotatable on an eccentric forming a part of the resonator staff, drives an index wheel, in turn connected through a gear train to the watch hands. Provision is made for rapid calendar setting, automatic calendar drive and an on-off switch breaks the electronic circuit from a 3 volt battery in the watch when the setting arbor is moved to the off position.

3,676,994

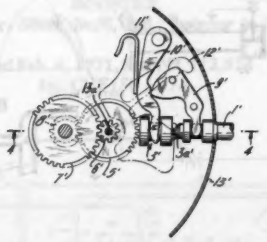
HAND SETTING MECHANISM FOR WATCHES

Katsuhiko Morita, Tokyo, Japan, assignor to Kabushiki Kaisha Daini, Tokyo, Japan

Filed Aug. 8, 1969, Ser. No. 848,642

Int. Cl. G04b 27/04

U.S. Cl. 58—68 **2 Claims**



A hand-setting mechanism for wrist and pocket watches having a single clutch gear directly, releasably coupling the watch winding stem to a gear train for setting the hands of a watch. The clutch gear is coupled with the winding stem through a socket thereon releasably receiving an end of the winding stem. Each of the mechanism gears has its axis of rotation in a given common plane passing through the longitudinal axis of the winding stem, and the cross-section of the arrangement has a minimum dimension so that watches provided with the mechanism can have minimum transverse and thickness dimensions.

3,676,995

RETURN MECHANISM FOR A STOPWATCH OR A CHRONOGRAPH

Katsuhiko Morita, and Yoshio Yamamoto, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed April 6, 1970, Ser. No. 25,718

Claims priority, application Japan, April 16, 1969, 44/34159; April 16, 1969, 44/34160

Int. Cl. G04f 7/04

U.S. Cl. 58—76 **1 Claim**

In a return mechanism of a chronograph or stopwatch, a plurality of heart-shaped cams are returned to zero position by means of a rotatable hammer having an equal number of acting surfaces which press against the cams during actuation. Each of the acting surfaces in excess of one is flexible with respect to the remainder of the hammer.

3,676,996

WATERPROOF WATCH CASE

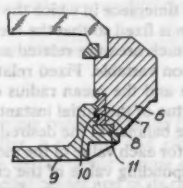
Yoshiaki Fujimori, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed March 12, 1970, Ser. No. 18,991

Claims priority, application Japan, March 28, 1969, 44/27092

Int. Cl. G04b 37/08

U.S. Cl. 58—90 R **3 Claims**



Deterioration of the performance of a watch as the result of fine shavings produced in the assembly of a threaded case-body and a threaded case-back is avoided by interposing an annular ring of a metal of the same hardness as the case-back. Water-tightness of the watch is achieved by seating both the case cover and case-back on a gasket.

3,676,997

STRUCTURE FOR SEALING A WATCH CRYSTAL IN A WATERPROOF WATCH

Yoshiaki Fujimori, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Aug. 16, 1971, Ser. No. 171,871

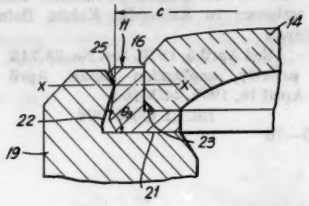
Claims priority, application Japan, Aug. 17, 1970, 45/71598

Int. Cl. G04b 37/08, 39/00

U.S. Cl. 58—90 R **7 Claims**

A watch crystal is sealed into a watch by means of an annular gasket of a relatively hard material such as a synthetic resin or soft metal. The parts comprising the seal are so dimensioned that the crystal seats in the gasket in an interference fit

and the gasket fits in the case body in an interference fit. Such gaskets, while providing an effective seal even when subjected



to high pressure, have long life, and hold the crystal sufficiently strongly so that a bezel is not needed.

3,676,998

BALANCE FOR A TIME PIECE

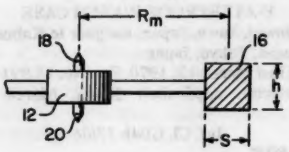
Andre Simon-Vermot, Fougeres, and Charles-Andre Grossenbacher, Georges-Perrenoud, both of Switzerland, assignors to Les Fabriques d'Assortiments Reunies, Neuchatel, Switzerland

Continuation-in-part of Ser. No. 733,416, May 31, 1968, abandoned. This application Sept. 1, 1970, Ser. No. 68,696

Claims priority, application Switzerland, June 2, 1967, 7834/67

Int. Cl. G04b *17/00*

U.S. Cl. 58—107 **4 Claims**



A balance for a timepiece in which the cross-sectional shape of the balance rim is fixed so that the cross-sectional area and the perimeter of such area are related and definable in terms of a single common variable. Fixed relationship between this common variable and the mean radius of the balance rim is established by virtue of the initial instantaneous power available to oscillate the balance at the desired initial amplitude and frequency. Thus, for each value of the mean radius there exists not only a corresponding value of the cross-sectional area of the balance rim but also a corresponding value of the perimeter of such area. Optimum balance dimensions are obtained from these corresponding values by selecting that value of mean radius which, for the corresponding value of cross-sectional area of the balance rim, produces a maximum value of moment of inertia for the balance with a decrease in amplitude after 24 hours within predetermined limits.

3,676,999

SUPERCHARGING MEANS FOR INTERNAL-COMBUSTION ENGINES

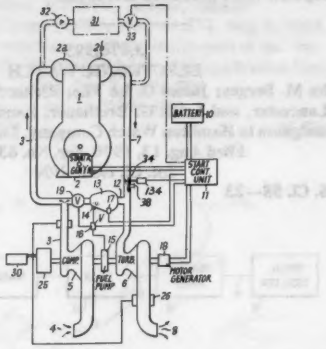
Thomas Alfred Oldfield, Warsash, England, assignor to The Plessey Company Limited, Ilford, England

Filed Aug. 7, 1970, Ser. No. 62,069

Int. Cl. F02b *37/00*

U.S. Cl. 60—13 **2 Claims**

To enable achievement, in an I.C. engine having an exhaust-driven turbo-charger, of a desired booster rate, and thus of a desired overall compression ratio, more particularly at low engine speeds and even at the moment of starting, additional operating gas is made available for the turbo-charger by a by-pass from the outlet of the turbo-charger compressor to the inlet of the turbo-charger turbine downstream of the engine and the operation of an auxiliary burner for increasing the supply of driving power to the turbo-charger turbine, utilizing for its combustion such by-pass air and optionally also residual oxygen in the engine exhaust gas, and to further increase the



amount for combustion air available in the engine, a dump valve is provided for venting at low engine speeds, the engine exhaust direct to atmosphere while isolating it from the gas flowing from the turbo-charger compressor via the auxiliary burner to the turbo charger turbine.

3,677,000

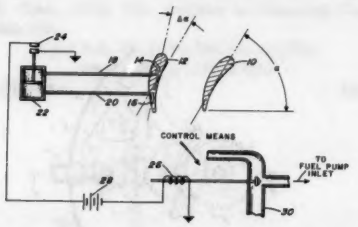
SYSTEM FOR THE DETECTION AND CONTROL OF COMPRESSOR STALL

Faulkner C. Thomson, 5411 19th Ave., Hillcrest Heights, Md.

Filed April 27, 1970, Ser. No. 32,015

Int. Cl. F02c *9/04*; F01d *17/02, 21/00*

U.S. Cl. 60—39.28 **6 Claims**



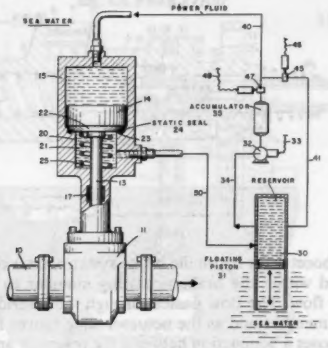
A system for the direct detection of compressor stall during acceleration in gas turbine engines and a direct control which reduces fuel flow in time to prevent the stall. One or more vanes is set at a higher angle of attack than the balance of the vanes in a compressor stage determined to be the most likely to suffer stall first. Flow separation, which is associated with the onset of compressor stall, results in a change in vane surface pressure. This pressure differential is detected by a pressure sensor through taps located in the selected vanes. Actuation of the differential pressure sensor closes a switch to energize a solenoid-operated fuel bypass valve which causes a reduction in fuel flow to eliminate the stall.

3,677,001

SUBMERGED HYDRAULIC SYSTEM

Thomas W. Childers, Woodland Hills; Joseph A. Burkhardt, Chatsworth, and Roger J. Koerner, Santa Monica, all of Calif., assignors to Esso Production Research Company

Division of Ser. No. 787,151, Dec. 26, 1968, abandoned. This application May 4, 1970, Ser. No. 46,585
Int. Cl. F15b *1/02*
U.S. Cl. 60—51 5 Claims



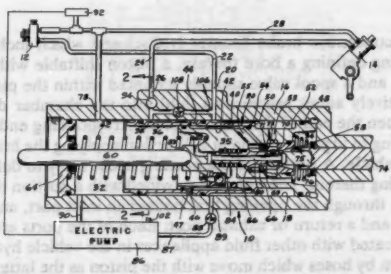
A static seal for a power fluid operated actuator is arranged in a cylinder to close off the space between a piston and a cylinder in which the piston reciprocates at the end of the power stroke of the piston. The piston has a fixed stroke and may be used to actuate apparatus requiring definite movements, such as valves and flow diverters. The piston may be single or double acting. For remote underwater operations, the actuator is connected into a closed hydraulic system which also includes a hydraulic reservoir, an electrically powered pump and a hydraulic accumulator to furnish hydraulic power fluid to the cylinder. Electrically operated valves are used to direct the flow of power fluid in the proper directions. The piston is spring-loaded to permit the piston to exhaust the cylinder and return the piston to its initial position to operate automatically the apparatus being actuated in the event of power failure.

3,677,002

SUBSIDIARY SUPPLY FOR HYDRAULIC BRAKE BOOSTER

Keith H. Fulmer, South Bend, Ind., assignor to The Bendix Corporation

Filed Feb. 4, 1971, Ser. No. 112,524
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 B 10 Claims



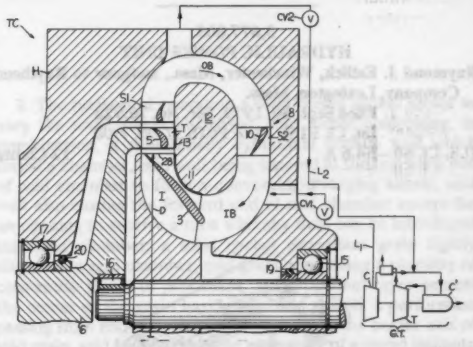
A vehicle brake applying mechanism which utilizes a dual source of fluid under pressure to assist the vehicle operator in slowing or stopping the vehicle. The mechanism includes a hydraulic brake booster comprising an operator controlled piston slidably located in a housing for movement at the will of the operator, through the manipulation of valve means to thereby establish a braking force in a master cylinder to which the piston is connected. Under normal conditions the brake booster receives its main source of fluid under pressure from an engine-driven pump which also supplies fluid to the vehicle's steering gear. However, an independent subsidiary source of fluid under pressure is supplied to the booster should the main source of fluid reach a predetermined minimum value. The subsidiary source is activated or rendered effective by a low flow sensitive switch located in the main supply for energizing an electric pump which is in communication with the booster piston via the valve means. The subsidiary source also actuates a shut-off valve interposed between the booster and steering gear to disestablish flow to the gear, thus conserving the subsidiary source for booster use only.

3,677,003

AERODYNAMIC TORQUE CONVERTER

Raymond C. Schneider, Rockford, Ill., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Feb. 1, 1971, Ser. No. 111,277
Int. Cl. F16d *33/00*; F16h *41/00*
U.S. Cl. 60—54 14 Claims



An aerodynamic torque converter of the fixed housing type and having an impeller, a turbine, and either one or more stages of stators. The aerodynamic torque converter has the exit angles of its impeller blades and of its radial inflow stator blades arranged within certain ranges, to provide a flat horsepower input curve, at constant input rotational speed, for the converter. The torque converter finds particular utility with a prime mover which runs at a constant speed and constant torque, such as a gas turbine. An aerodynamic torque converter of the above type also having continually converging flow path areas in the outer and inner bends of the flow path.

3,677,004

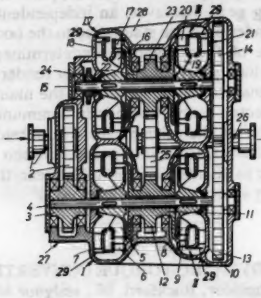
HYDRODYNAMIC REVERSING GEAR

Helmut Muller, Heidenheim, and Gustav Pistl, Nattheim, both of Germany, assignors to Voith Getriebe KG, Heidenheim (Brenz), Germany

Filed Nov. 9, 1970, Ser. No. 87,835
Claims priority, application Germany, Nov. 8, 1969, P 19 56 244.8
Int. Cl. F16h *41/00*
U.S. Cl. 60—54 9 Claims

In hydrodynamic reversing gears, in order to eliminate excessive heating due to windage losses generated during rota-

tion in the absence of hydraulic liquid, there are provided in the convertor work chamber air flow obstructing members movable into an operative (blocking) position when hydraulic



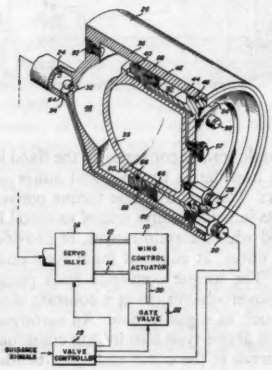
liquid is withdrawn from the work chamber and movable into an inoperative (flow transmitting) position when hydraulic liquid is introduced into the work chamber.

3,677,005

HYDRAULIC POWER UNIT

Raymond J. Estlick, Winchester, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 30, 1970, Ser. No. 76,928
Int. Cl. F15b 7/00; F01b 31/00, 7/00
U.S. Cl. 60—54.6 A **12 Claims**



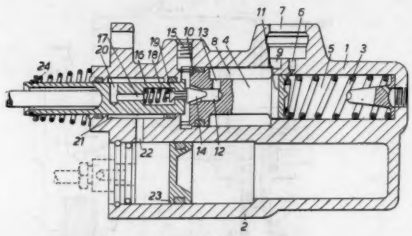
A hydraulic power unit from which a hydraulic fluid may be discharged under pressure to the wing control actuators of a guided missile, the actual pressure at which such fluid is discharged during operation being changed in accordance with the requirements of the wing control actuators. In one of two embodiments disclosed the power unit includes two plenum chambers for the hydraulic fluid, means for independently varying the pressure on the hydraulic fluid in each one of such chambers using a source of substantially constant pressure for such purpose, and means for connecting the wing control actuators to either one of the plenum chambers as required during the flight of the guided missile.

3,677,006

BOOSTER FOR HYDRAULIC SYSTEMS

Hans Erdmann, Neu-Isenburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed July 21, 1970, Ser. No. 56,829
Claims priority, application Germany, July 23, 1969, P 19 37 317.2
Int. Cl. F15b 7/00
U.S. Cl. 60—54.6 P **14 Claims**



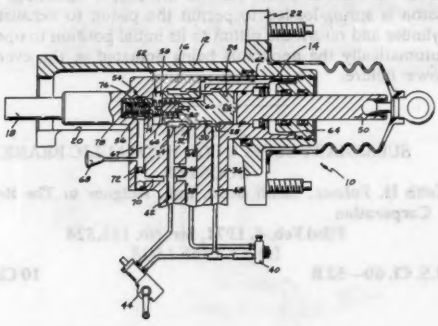
This booster for hydraulic brake systems has a control valve arranged within the brake actuating member to control the booster flow. The flow passes through the interior of the actuating member and as the actuator slide moves forward, the valve closes a connection between the reservoir and the working chamber before opening the connection between the booster and the working chamber.

3,677,007

CONCENTRIC BRAKE BOOSTER WITH MOVING HOSES

Edward J. Goscenski, Marshall, Mich., assignor to The Bendix Corporation

Filed Sept. 29, 1970, Ser. No. 76,409
Int. Cl. F15b 7/00; F03b ; F01b 25/02
U.S. Cl. 60—54.6 P **9 Claims**



A concentric brake booster is disclosed which includes a housing defining a bore therein, a piston shiftable within the bore, and a spool valve slidably mounted within the piston to selectively admit pressurized fluid into the chamber defined between the end of the piston and a corresponding end of the housing to urge the piston in a direction applying the brakes of the vehicle. A portion of the housing is cut away to define an opening therein. The piston is provided with a portion that extends through the opening that houses an inlet port, an outlet port, and a return or exhaust port. Each of the ports are communicated with other fluid appliances in the vehicle hydraulic system by hoses which move with the piston as the latter shifts within the housing. A fluid storage device or accumulator is provided to supply pressurized fluid to the brake booster to be used to shift the piston when a malfunction prevents proper

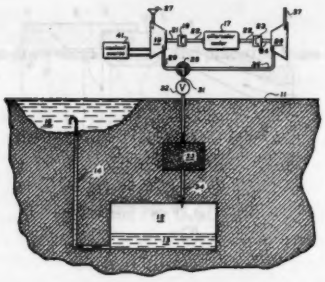
operation of the vehicle's power steering pump which normally supplies pressurized fluid to the booster.

3,677,008

ENERGY STORAGE SYSTEM AND METHOD

Stanley L. Koutz, San Diego, Calif., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Feb. 12, 1971, Ser. No. 115,017
Int. Cl. F01k 27/00
U.S. Cl. 60—59 T 11 Claims



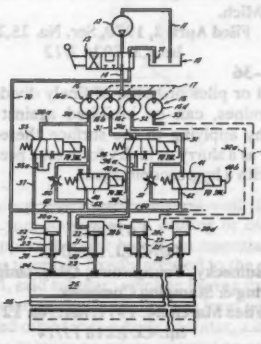
A method and system are described for using compressed air for storing and utilizing energy. Air is compressed and stored and the heat of compression is removed from the air prior to storage. The air is subsequently removed from storage and the stored heat is restored to the air prior to expansion of the air for deriving work.

3,677,009

CONTROL ARRANGEMENT FOR THE MALE DIE OF A HYDRAULIC PRESS BRAKE

Russell S. Thatcher, Galveston, Tex., assignor to Kelso Marine, Inc., Galveston, Tex.

Filed Nov. 12, 1970, Ser. No. 88,531
Int. Cl. F15b 11/22
U.S. Cl. 60—97 E 6 Claims



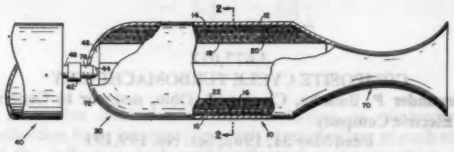
A control arrangement for maintaining the male die of a hydraulic press brake aligned in a predetermined relationship relative to its longitudinal axis during metal braking operations so as to compensate for variations in the resistance to being formed in the metal work piece to thereby maintain the male die properly aligned longitudinally and inhibit erratic bending of the metal work piece and possible die damage.

3,677,010

ROCKET MOTOR AND METHOD

Robert H. Fink, and Eugene J. Palm, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army

Filed March 11, 1964, Ser. No. 351,256
Int. Cl. C06d 5/10; F02k 9/06
U.S. Cl. 60—220 10 Claims



7. The method of operating a solid-fueled rocket motor to vary the total impulse achieved, said motor comprising, in combination, a substantially cylindrical outside wall which forms a chamber, said wall being tapered at the rearward end of said chamber to form a converging-diverging nozzle, said wall also closing the forward end of said chamber except for an opening to receive a tube whereby fluid can be introduced into said chamber; a solid rocket propellant grain rigidly disposed in said chamber, said grain comprising a plurality of concentric layers of propellant, the propellant layer nearest the center of the grain having disposed therein a perforation passing from end to end therethrough along the center axis of said grain, said layers consisting essentially of a cured intimate mixture of polymeric binder, fuel particles, and an oxidizer therefor, said layers being completely separated from each other by a liner, said liner consisting essentially of a cured polymeric material incapable of supporting its own combustion, said method comprising:

a. igniting and burning the innermost layer of propellant, thereby exposing the adjacent liner;

b. introducing into the forward end of said chamber through said opening an oxidizer fluid which is hypergolic with said liner whereby the liner ignites, burns, and in turn ignites the adjacent layer of propellant; and

c. repeating steps (a) and (b) until as many propellant layers as desired have been consumed.

3,677,011

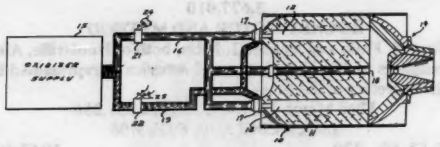
THRUST CONTROL SYSTEM FOR HYBRID ROCKET MOTORS

Clayton W. Vickland, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Jan. 22, 1969, Ser. No. 793,195
Int. Cl. F02k 9/06
U.S. Cl. 60—251 2 Claims

A high specific impulse rocket motor having the impulse delivered at two thrust levels with restart capability has oxidizer supplied to an aft injector and to a plurality of primary

injectors located within the forward ends of a plurality of fuel grain ports. The flow of oxidizer is controlled by two solenoid valves which control the sustain flow and the boost flow of oxidizer. Poppet valves are provided in the primary injectors and the aft injector and are opened by the pressure of the oxidizer delivered through the sustain system.

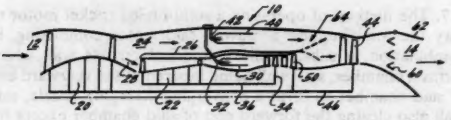


3,677,012

COMPOSITE CYCLE TURBOMACHINERY

Alexander P. Batscha, Cincinnati, Ohio, assignor to General Electric Company

Filed May 31, 1962, Ser. No. 199,191
Int. Cl. F02k 1/02
U.S. Cl. 60—262 **7 Claims**



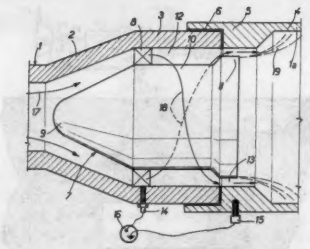
1. A composite fluid flow turbomachine comprising:
a first compressor;
a second compressor, said second compressor being arranged to continuously receive a part only of the flow from said first compressor,
an inner duct surrounding said second compressor;
an outer duct surrounding said first compressor and said inner duct;
means for injecting fuel within said outer duct and said inner duct for supporting combustion therein downstream of said first compressor and said second compressor, respectively;
a first power turbine located in said inner duct and receiving an integral fluid flow stream from said first and second compressors;
a second power turbine located partially in said outer duct, said second power turbine receiving a fluid flow stream from said first compressor and the integral fluid flow stream from said first and second compressors;
an outer driveshaft, said first power turbine and said second compressor being mounted on said outer driveshaft for rotation therewith;
an inner driveshaft concentric to said outer driveshaft, said second power turbine and said first compressor being mounted on said inner driveshaft for rotation therewith;
and a power transfer turbine, said power transfer turbine being arranged in series flow relation with said first and second power turbines, said power transfer turbine being mounted on said inner driveshaft and furnishing power to help drive said first compressor, whereby the overall cycle efficiency of said composite fluid flow turbomachine is increased.

3,677,013

DEVICE FOR BURNING THE UNBURNT RESIDUE IN THE EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Louis Jules Bauger, Vanves; Roland Robert Charles Beyler, Levallois-Perret; Henri Le Guen, Fontenay-Saux-Roses; Jacques Eloi Pidebois, and Michel Bernard Schenher, both of Paris, all of France, assignors to Societe National D'Etude et de Construction de moteurs D'Aviation, Paris, France

Filed Dec. 28, 1970, Ser. No. 101,737
Claims priority, application France, Dec. 29, 1969, 6945301
Int. Cl. F01n 3/14
U.S. Cl. 60—303 **14 Claims**



A device for burning the unburnt constituents in the exhaust gases of a heat engine, for example a motor car engine, in which the exhaust gases, to which air may have been added, pass through an annular channel where sparks jump between an inner electrode and an outer electrode forming a wall of a combustion chamber. The annular channel is formed between the inner electrode and a conducting wall insulated electrically from the wall of the combustion chamber, the inner electrode being connected to the conducting wall by conducting vanes which impart a rotational movement to the gases in the annular channel, and the sparks jump in a restricted outlet of the annular channel located between the wall of the combustion chamber and a wider downstream part of the inner electrode.

3,677,014

METHOD OF INHIBITING WIND MOVEMENT OF LOOSE PARTICLES FROM SURFACES

Caleb M. Stout; Kenneth H. Nimerick, and Christ F. Parks, all of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed April 2, 1970, Ser. No. 25,245
Int. Cl. E02d 3/12
U.S. Cl. 61—36 **6 Claims**

Loose soil or piles or heaps of finely divided material, e.g. tailings of mines, can be inhibited against excessive wind movement by applying to the surface thereof a polyacrylamide, either as a slurry or in dry form on a prewet surface or in admixture with a hygroscopic agent.

3,677,015

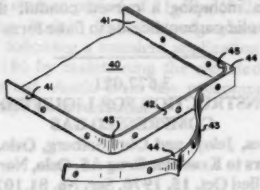
TUNNEL LINING

Nicholas Chlumecky, Youngstown, Ohio, assignor to Commercial Shearing & Stamping Company

Filed March 24, 1971, Ser. No. 127,553
Int. Cl. E21d 11/14
U.S. Cl. 61—45 R **4 Claims**

A tunnel liner is provided in the form of a plurality of rectilinear arcuate side by side members forming a cylinder, each member having inturned flange on all edges, a triangular low compressibility elastomer member on each corner of each

arcuate member, a layer of elastomer foam on each flange surface and triangular member, and means acting on adjacent



flanges to draw them together and place the foam under compression.

ERRATUM

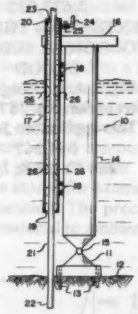
For Class 61—46 see:
Patent No. 3,677,113

3,677,016

CORROSION PROTECTION FOR WELL CASING OF OFFSHORE STRUCTURE

James P. Garrigus, Downers Grove, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Feb. 8, 1971, Ser. No. 113,190
Int. Cl. E02d *21/00*; E21b *15/02*
U.S. Cl. 61—46.5 7 Claims



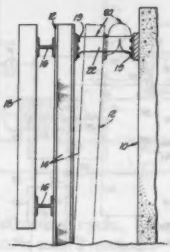
An offshore deep water oscillating oil well drilling or oil production structure having an oil drilling or oil production platform and support therefor having an essentially vertically displaced tubular template fixedly secured to the platform and platform support, said tubular template having its bottom end open and positioned to project below sea level when the platform is positioned offshore in a body of water, a closure at the upper end of the tubular template adapted to seal and close the annular space between the tubular template and a casing positioned in the tubular template, and a conduit communicating with the inside of the tubular template below the closure for feeding oil inside the tubular template.

3,677,017

DOCK FENDER STRUCTURE

John Anoush Shirvany, Simi, Calif., assignor to Byron Jackson, Inc., Long Beach, Calif.

Filed Oct. 20, 1970, Ser. No. 82,281
Int. Cl. E02b *3/22*
U.S. Cl. 61—48 10 Claims



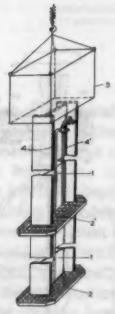
A marine dock fender element having an elastomeric deflection body in connection with support plates at each end of the deflection body with deflection guide members associated with each support plate and the deflection body.

3,677,018

METHOD FOR DRIVING A FOUNDATION ELEMENT INTO THE EARTH BY MEANS OF VIBRATION

Abraham Francois Van Weele, Waddinxveen, Netherlands, assignor to N.V. tot Aanneming van Werken voorheen H.J. Nederhorst, Gouda, Netherlands

Filed April 15, 1970, Ser. No. 28,709
Claims priority, application Netherlands, April 22, 1969, 6906153
Int. Cl. E02d *7/18, 3/12*
U.S. Cl. 61—53.5 3 Claims



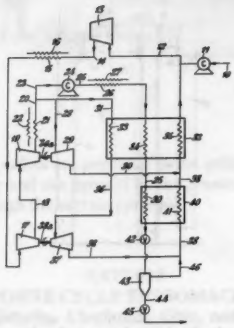
A method for driving a foundation element into the earth by means of vibration. According to the invention at least one perforated supporting member is taken along by the foundation element when this element is vibrated into the earth. This perforated supporting member may be a perforated plate or a grid composed of upstanding partitions.

3,677,019

GAS LIQUEFACTION PROCESS AND APPARATUS

Walter S. Olszewski, Tonawanda, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 1, 1969, Ser. No. 846,707
Int. Cl. F25j *1/00, 1/02*
U.S. Cl. 62—9 15 Claims



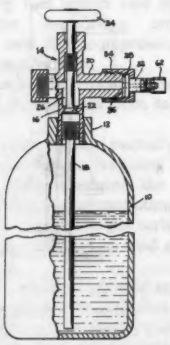
This invention relates to a method and apparatus for the liquefaction of low boiling gases for example nitrogen and natural gas. By the use of parallel refrigerant expansion engines and feed compression the product cooling curve in the liquefaction zone is altered so that the specific heat of the feed gas in the liquefaction zone is reduced to about 1.5-15 times the specific heat of the low pressure refrigerant gas in the zone. This has the effect of distributing the refrigerant required by the feed over a substantially wider temperature range so that the average ΔT may be substantially reduced and the process efficiency improved.

3,677,020

METHOD AND APPARATUS FOR FORMING CARBON DIOXIDE SNOW

Edward A. Munselle, 12591 Singing Woods Road, Santa Ana, Calif.

Filed May 25, 1970, Ser. No. 41,150
Int. Cl. F25j *1/00*
U.S. Cl. 62—10 14 Claims



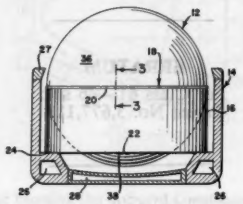
A fitting is attached to the conventional valve of the standard carbon dioxide siphon cylinder. The fitting has an expansion orifice that is positioned immediately adjacent the outlet port of the valve. The position of the orifice and its size, within the range of 0.005 through 0.012 inches, maximize efficiency of production of solid carbon dioxide and minimize time lag between starting and stopping of production upon operation of the standard valve. The expansion orifice is provided by a readily removable and replaceable insert of the fitting and provision is made for quickly securing to the fitting a number of attachments including a curved conduit that optimizes production of solid carbon dioxide in flake form.

3,677,021

TANK CONSTRUCTION FOR LIQUIFIED AND/OR COMPRESSED GAS

Ragnar Bognaes, Jeloy, and Olav Solberg, Oslo, both of Norway, assignors to Kvaerner Brug AS, Oslo, Norway

Filed Oct. 15, 1970, Ser. No. 81,102
Claims priority, application Norway, Oct. 18, 1969, 4146/69
Int. Cl. F17c *13/08*
U.S. Cl. 62—55 16 Claims



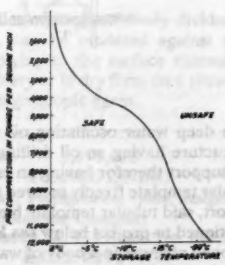
In a marine vessel for transporting or storing a cargo tank adapted to contain liquified and/or compressed gas which tank is mounted on supporting structure connected to the hull of the vessel, the tank has a peripheral integral interface structure such that the exterior periphery of the interface structure extends beyond the periphery of adjacent portions of the tank to define an extension member which is adapted to be rigidly secured to the tank support structure.

3,677,022

METHOD FOR EXTENDING THE USEFUL STORAGE PERIOD OF BIOLOGICAL SUBSTANCES SUCH AS BLOOD

Ralph E. Schwartz, Elgin, Ariz., assignor to Redeco, Inc.

Continuation-in-part of Ser. No. 757,195, Aug. 8, 1968, Pat. No. 3,579,999. This application July 24, 1969, Ser. No. 844,507
Int. Cl. C12k *1/00*
U.S. Cl. 62—56 9 Claims



The invention contemplates extending the useful storage period for biological substances, such as whole blood, beyond

the period presently available with the existing technique of mere storage at 4° C. Such extension is achieved by subjecting the biological substance to a "precompression" pressure elevated above ambient atmospheric, commencing at a time which is substantially prior to expiration of the presently accepted useful storage period of 21 days (following extraction from a living body). Useful storage-period extension is achieved (a) following a transient application of the elevated pressure, or (b) by maintaining the elevated pressure for a prolonged period. Aside from the precompression, storage techniques may be conventional.

3,677,023

PROCESS FOR DEHYDRATING ACETIC ACID

Yun-Chung Sun, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 1, 1970, Ser. No. 42,491
Int. Cl. B01d 9/04; C07c 53/08
U.S. Cl. 62—58 6 Claims

A process for dehydrating acetic acid containing up to about 20 weight percent water is disclosed wherein the crude acetic acid is cooled sufficiently to crystallize a substantial portion of pure acetic acid, and the remaining mother liquor, i.e., uncrystallized material, is vaporized under vacuum, i.e., at a pressure not exceeding about 15 mm. Hg, from the acetic acid crystals at a temperature between the freezing point of acetic acid and the eutectic temperature.

3,677,024

PRESERVATION AND STORAGE OF BIOLOGIC MATERIALS

Paul E. Segall, 15 Cambridge Road, East Rockaway, N.Y.

Filed Jan. 20, 1970, Ser. No. 4,430
Int. Cl. F25d 17/02
U.S. Cl. 62—64 15 Claims

Method for preserving and storing biologic material including viable beings, living tissue and organs, foodstuffs and the like. The biologic material is subjected to ultrahyperbaric pressure of about 2.0×10^3 atmospheres in the presence of inert gas. The temperature is reduced to about −20° C., whereupon the material is subjected to a further pressure increase to below about 3.4×10^3 atmospheres to effect a phase change of water from the liquid phase to the solid phase. The temperature and pressure of the material is then reduced to about atmospheric pressure at the temperature necessary to maintain the formed solid phase of water. Under such conditions the materials may be stored for extended periods of time without significant deterioration. The process of preservation is reversed to restore the material to ambient conditions.

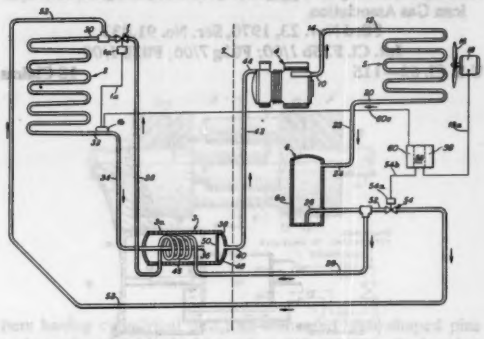
3,677,025

DEFROSTING ARRANGEMENT AND METHOD FOR A REFRIGERATION SYSTEM

Harold R. Payne, La Habra, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 13, 1971, Ser. No. 106,190
Int. Cl. F25b 9/00
U.S. Cl. 62—81 5 Claims

A defrosting gas is provided in a refrigeration system by compressing a gaseous refrigerant and evaporating controlled amounts of liquid refrigerant carried by the gaseous refrigerant, the latent heat of evaporation being used to defrost the evaporator. The defrosting gas is conducted from the compressor discharge outlet to the evaporator inlet by way of the condenser and the receiver, whereby the accumulation of migratory refrigerant in the receiver is prevented to ensure a sufficient supply of refrigerant in the defrosting circuit



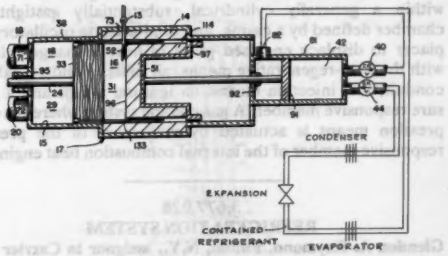
throughout the defrosting cycle. Means are provided for operating the system in such a manner.

3,677,026

INTERNAL COMBUSTION HEAT ENGINE AND PROCESS

Eric G. U. Granryd, Viggbyholm, Sweden, assignor to American Gas Association, Arlington, Va.

Filed Nov. 20, 1970, Ser. No. 91,355
Int. Cl. F25b 1/00; F03g 7/06; F02b 1/00
U.S. Cl. 62—115 17 Claims



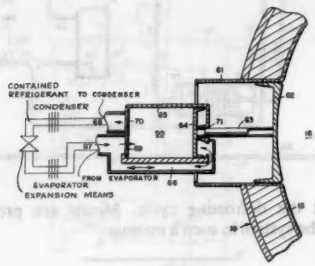
A process for conversion of chemical energy to mechanical energy by heating air within a substantially gastight gas chamber by passage in heat-exchange relation with a moving heat-regenerative means within the chamber, substantially continuous burning of an injected combustible fluid fuel during injection thereof resulting in substantial increase in the average temperature-pressure relation of the gas within the gas chamber, expanding said gas chamber by movement of a pressure-responsive member, and heating the heat-regenerative means by passage of the combustion product gas in heat-exchange relation with the moving heat-regenerative means. An internal combustion heat engine having a movable heat-regenerative means within a sub-stantially gastight gas chamber defined by a casing, the movable heat-regenerative means by its movement causing passage of enclosed gases in heat-exchange relation with the heat-regenerative means, and having an air intake conduit, exhaust conduit, fuel injection means, an ignition means and a pressure-responsive member. A gas cooling system wherein a compression means is actuated by movement of the pressure-responsive member of the internal combustion heat engine.

3,677,027

INTERNAL COMBUSTION HEAT ENGINE AND PROCESS

Eric G. U. Granryd, Viggbyholm, Sweden, assignor to American Gas Association

Filed Nov. 23, 1970, Ser. No. 91,833
Int. Cl. F25b *1/00*; F03g *7/06*; F02b *1/00*
U.S. Cl. 62—115 **18 Claims**



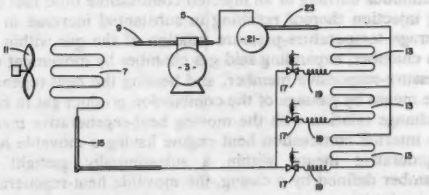
A process for conversion of chemical energy to mechanical energy by heating air within a substantially gastight gas chamber by passage in heat-exchange relation with a heat-regenerative means, within the chamber, substantially continuous burning of an injected combustible fluid fuel during injection thereof resulting in substantial increase in the average temperature-pressure relation of the gas within the gas chamber, expanding said gas chamber by movement of a pressure responsive member, and heating the heat-regenerative means by passage of the combustion product gas in heat-exchange relation with the heat-regenerative means. An internal combustion heat engine having a heat-regenerative means within a generally cylindrical, substantially gastight gas chamber defined by a casing, and semi-arcuate oscillatory displacer to displace enclosed gases in heat-exchange relation with the heat-regenerative means, air intake conduit, exhaust conduit, fuel injection means, an ignition means and a pressure responsive member. A gas cooling system wherein a compression means is actuated by movement of the pressure responsive member of the internal combustion heat engine.

3,677,028

REFRIGERATION SYSTEM

Glendon A. Raymond, Fulton, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 1, 1970, Ser. No. 94,036
Int. Cl. F25b *5/00*
U.S. Cl. 62—200 **3 Claims**



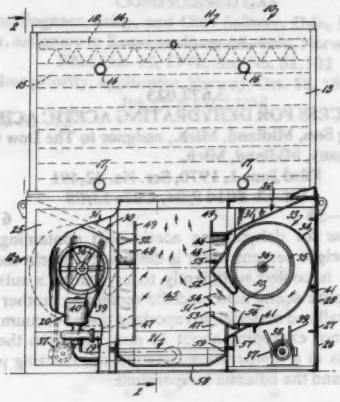
A refrigeration system employing a plurality of evaporator circuits, the refrigerant flow to each circuit being controlled by a shut-off valve and a fixed restriction, the valve when open providing a first stage restriction to minimize the required pressure drop across the fixed restriction.

3,677,029

EVAPORATIVE CONDENSER

Bruce S. Schaeffer, and John A. Pike, both of Waynesboro, Pa., assignors to Frick Company, Waynesboro, Pa.

Filed Dec. 3, 1970, Ser. No. 94,708
Int. Cl. F28d *5/00*
U.S. Cl. 62—305 **9 Claims**



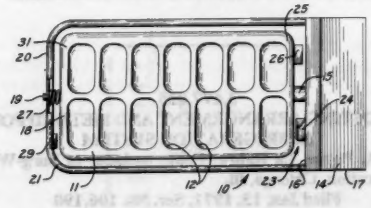
An evaporative condenser of the push-through type has the blower located directly beneath the coils and its horizontal discharge directed upwardly at an angle from the horizontal. An arrangement of roofs and shielding prevent the introduction of water into the fan and the air direction means; drainage is provided for any water that may inadvertently enter the fan housing or air directing means.

3,677,030

AXIALLY MOVABLE TWIST TRAY DOMESTIC ICE MAKER

Duane W. Nicholas, Evansville, Ind., assignor to Whirlpool Corporation

Filed June 17, 1970, Ser. No. 46,924
Int. Cl. F25c *1/10*
U.S. Cl. 62—353 **7 Claims**

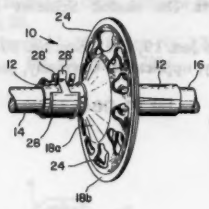


An ice body maker having means for twisting the tray in which the ice bodies are formed to free the ice bodies therefrom for harvesting. The tray is twisted by rotating the tray while temporarily holding one portion of the tray. Upon completion of the freeing operation, the tray is released for continued rotation in completing a cycle of the apparatus.

3,677,031
LOW COST ROTARY SHAFT COUPLING AND METHOD OF MAKING SAME

Stephen J. Zierak, Westwood, and Arnold J. Monteiro, Sharon, both of Mass., assignors to Metal Bellows Corporation, Sharon, Mass.

Continuation-in-part of Ser. No. 32,323, April 27, 1970, abandoned. This application Aug. 24, 1970, Ser. No. 66,261
Int. Cl. F16d 3/78
U.S. Cl. 64—13 5 Claims

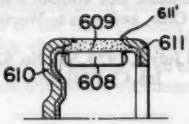


A rotary shaft coupling is composed of two identical sections. Each section consists of a dished annulus whose inner edge is flanged. Each section also includes a hub in the form of a split sleeve, one end of which has radially outwardly projecting tabs. The sleeve is received in the annulus so that the tabs engage the flanged inner edge of the annulus. When the sleeve is seated in this fashion, it is concentric with the annulus and properly positioned axially with respect thereto. The tabs are then brazed to the inner edge of the annulus. Two of these sections are positioned coaxially opposite one another and the outer annulus edges are continuously welded all around to complete the coupling.

3,677,032
SHELL TYPE NEEDLE BEARING

Toshio Suzuki, Fujisawa-shi, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 20, 1970, Ser. No. 4,247
Claims priority, application Japan, Jan. 22, 1969, 44/4356; Jan. 22, 1969, 44/4357; Jan. 22, 1969, 44/4358
Int. Cl. F16d 3/24; F16c 19/00
U.S. Cl. 64—17 A 7 Claims



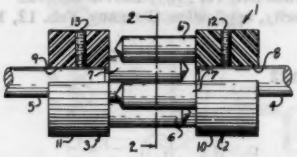
A shell type needle bearing capable of carrying an exceedingly heavy load. The outer ring of the bearing has a carburized layer on the roller contact surface and a non-carburized ductile and tough layer adjacent the carburized layer. The depth of the carburized layer is sufficient to resist the shearing stresses of the bearing load while the depth of the ductile layer is sufficient to resist cracking from sudden shock.

3,677,033
COUPLING

David Kneeland, 1001 W. U.S. 56 Highway, Olathe, Kans.

Filed Oct. 12, 1970, Ser. No. 79,867
Int. Cl. F16d 7/00
U.S. Cl. 64—28 R 9 Claims

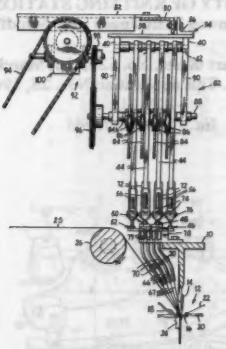
Mating coupling members for transferring motion from one member to another are disclosed which each have a plurality of pins positioned, shaped, and sized to mate with pins of another coupling member wherein each pin of one coupling member is received between and in line contact with a pair of adjacent pins of an other coupling member. Coupling members having cylindrical pins and truncated cone-shaped pins and members having shields enclosing the pins are disclosed as exemplary of the inventive concept.



3,677,034
METHOD OF AND MACHINE FOR MAKING FABRICS

Elsworth C. Simpson, Glens Falls, N.Y., assignor to Polylok Corporation, Glen Falls, N.Y.

Continuation-in-part of Ser. Nos. 639,836, May 19, 1967, Ser. No. 756,001, Aug. 28, 1968, abandoned. This application Feb. 24, 1970, Ser. No. 13,738
Int. Cl. D04b 23/10, 27/26
U.S. Cl. 66—84 14 Claims



Fabrics comprising a substrate, a multiplicity of spaced-apart design elements laid on the substrate along non-linear paths in the generally warpwise direction, and knit-stitching composed of parallel rows of stitches forming a series of loop chains are made on a stitch-through type machine equipped with a mechanism for feeding the design yarns to the stitch-forming part of the machine. The design element delivery mechanism includes at least one guide bar positioned substantially parallel to the row of stitch-forming elements and driven back and fourth transversely to the warp direction so that the design elements are guided back and forth past a multiplicity of the needles that form the loop chains. The design elements are bound to the substrate at some points by being pierced by the stitching thread and at other points by being embraced between the loops and laps of the stitching, the piercing or embracing being at random.

3,677,035
LATCH NEEDLE FOR KNITTING MACHINES

Wolfgang Wiederhut; Helmut Landenberger, and Ulrich Hofmann, all of Ebingen, Germany, assignors to Theodor Groz & Ernst Beckert Nadelfabrik Commandit-Gesellschaft, Ebingen, Germany

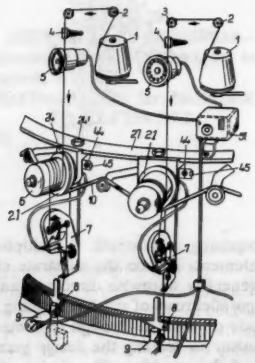
Filed Dec. 10, 1969, Ser. No. 883,925
Claims priority, application Germany, Feb. 12, 1969, P 19 06 892.9
Int. Cl. D04b *35/04*
U.S. Cl. 66—122 2 Claims

A latch needle for knitting machines having a latch provided with a hole and pivotably located in a longitudinal slot formed between faces of the needle shaft, and having a steel axle pin inserted through the hole, the ends of the pin being rotatably mounted in holes in the shaft faces, wherein the axle pin ends have a larger diameter in the region of the shaft faces than the portion of the pin in the latch hole.

3,677,036
METHOD OF EQUALIZING SUPPLY OF THREAD TO A PLURALITY OF KNITTING STATIONS

Charles Hatay, Alpenweg 7, Busingen near Schaffhausen, Germany

Continuation-in-part of Ser. No. 625,110, March 22, 1967, Pat. No. 3,523,433. This application Nov. 25, 1969, Ser. No. 879,711
Int. Cl. D04b *15/48*
U.S. Cl. 66—132 R 5 Claims

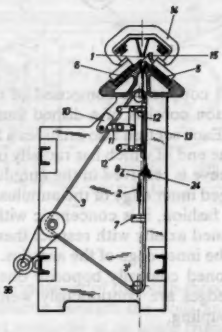


To provide equal supply of thread, a signal is generated representative of thread speed of each of the thread supplies, for example by wrapping thread around a disc subjected to pulsed illumination supplied from a pulse source. One knitting station is adjusted for perfect knitting, and the pulse source is then regulated so that the disc of that one station will appear stationary; thereafter, the other knitting stations are regulated, manually or by means of a servo motor, until they all appear stationary, that is until all the knitting stations are in synchronism. Additionally, thread tension is pre-set and sensed at each station, and the speed of a thread delivery drum controlled to provide constant thread tension to the knitting positions.

3,677,037
FLAT KNITTING MACHINE WITH AUTOMATIC TRANSFER DEVICE

Erich Krause, Bopfingen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed Jan. 19, 1971, Ser. No. 107,678
Claims priority, application Germany, Jan. 30, 1970, P 20 04 286.8
Int. Cl. D04b *35/00*
U.S. Cl. 66—147 7 Claims

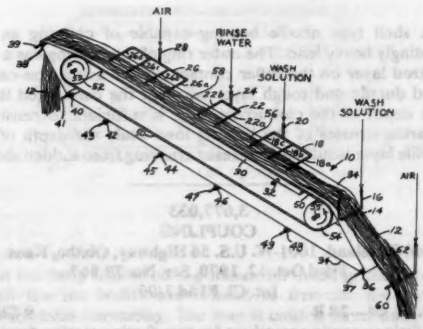


A knitted border is guided from the needles of a flat knitting machine to the points of a transfer bar releasably secured on the machine below the needle beds by gravity along guide wires passing through stitches in the last-knitted course. The stitches are transferred from the needles to the wires by the action of a cam on the knitting carriage.

3,677,038
FIBER WASHING APPARATUS

Warren Emery Hartman, and William Randall Johnson, both of Worthington, Ohio, assignors to Worthington Foods, Inc., Worthington, Ohio

Filed July 6, 1970, Ser. No. 52,393
Int. Cl. B05b *7/00*
U.S. Cl. 68—20 6 Claims



Apparatus is described for washing and drying a tow of proteinaceous fibers which comprises conveyor means for

conveying the tow along a generally horizontal flow path and a plurality of treating means positioned along the tow flow path for sequentially treating the tow, such treating means comprising means for applying wash solutions to the tow, means for moving wash solution from the tow, means for applying rinse solution to the tow, means for removing rinse solution from the tow and gas flow means for drying the tow.

3,677,039

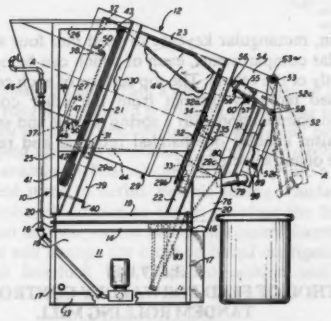
SLANT MOUNTED LAUNDRY MACHINE

William C. Files, Cincinnati, Ohio, assignor to McGraw-Edison Company, Elgin, Ill.

Filed March 11, 1971, Ser. No. 123,175

Int. Cl. D06f *37/04*

U.S. Cl. 68—146 **14 Claims**



A cylindrical tub of an imperforate leakproof construction is supported on a frame for rotation about its longitudinal axis without the use of an outer stationary shell or case and is mounted with its axis fixed and inclined to the horizontal. The tub is loaded through an opening at its upper end and is unloaded through an opening in its lower end closed during a washing, rinsing or drying operation by a door hinged to the frame. A special dynamic seal between the door and tub permits rotation of the tub without leakage and a chamber in the door which is in communication with the tub through a perforated inside wall of the door provides a hydraulic action between the washing chamber and the body of free washing liquid in the door chamber to achieve an efficient washing action. The rotating tub is provided with internal lifting fins.

3,677,040

APPARATUS FOR THE WASHING OF PRIMARILY, CELLULOSIC PULP

Bengt Edvard Pettersson, Sundsbruk, Sweden, assignor to Sunds Aktiebolag, Sundsvall, Sweden

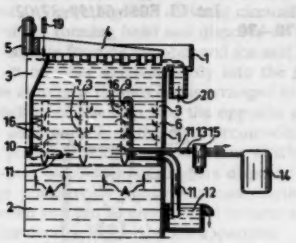
Division of Ser. No. 850,923, Aug. 18, 1969. This application May 14, 1971, Ser. No. 143,441

Claims priority, application Sweden, Sept. 18, 1968, 12572/68

Int. Cl. D21c *7/00*

U.S. Cl. 68—181 R **4 Claims**

In the liquid treatment of cellulosic pulp by a procedure comprising passing a column of a slurry of the pulp to be treated through a cylindrical vessel, in one direction, and forcing a treating liquid through the column, in a direction transverse to the major axis of the column, from a delivery space for such treating liquid toward a collection vessel for used treating liquid, said collection vessel having a pervious wall immediately adjacent said column on that side thereof remote from said delivery space, it is desirable—in the interest of preventing clogging of the pervious wall—intermittently to interrupt inflow of liquid into said vessel by pressure variations induced by a gaseous fluid discharged under pressure adjacent said pervious wall.



3,677,041

APPARATUS FOR WORKING FLAT, FLEXIBLE MATERIAL

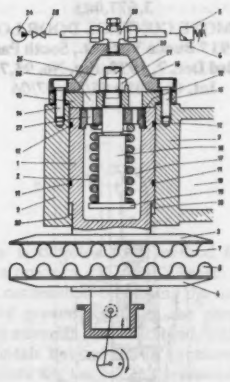
Jiri Dokoupil, Oberursel, Taunus, Germany, assignor to Maschinenfabrik Turner AG, Oberursel, Germany

Filed Aug. 19, 1970, Ser. No. 65,280

Claims priority, application Germany, Aug. 8, 1969, P 19 42 416.9; July 23, 1970, P 20 36 636.3

Int. Cl. C14b *1/40*

U.S. Cl. 69—33 **14 Claims**



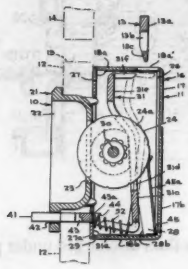
This invention relates to apparatus for working flat, flexible material by means of working members opposing each other. One of the working members is driven back and forth toward and away from the other working member. A piston to which the other working member is connected, is subject to a pressure from a pump and subject to a reset force whereby the piston may be adjusted to predetermined starting elevational positions to provide a desired working pressure. A pressure relief valve assures that the piston yields when the working pressure exceeds said desired pressure and returns to said starting position when the working pressure is reduced again. In a further embodiment an auxiliary pressure space of selectively variable volume is provided for adjusting said piston to different elevational starting positions even during the operation of the apparatus.

3,677,042

COMBINATION LOCK CONSTRUCTION

Wallace E. Atkinson, Petersburg, Va., assignor to Long Manufacturing Co., Inc., Petersburg, Va.

Filed March 19, 1971, Ser. No. 126,108
Int. Cl. E05b 65/52, 37/02
U.S. Cl. 70—70 10 Claims



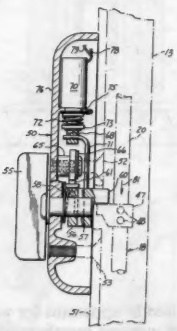
A combination lock for luggage cases and the like, including a keeper having an apertured end, to be mounted on one of the luggage case sections, and a latching sub-assembly to be mounted on the other case section. The latching sub-assembly includes a set of changeable combination dial wheels, and a tiltable fence biased to unlocking position having a latch tongue to interfit into the keeper aperture and having a forwardly projecting foot portion. A manual pushbutton member is provided to engage the foot portion and force the fence to tilt to unlocking position when the proper combination has been dialed and the pushbutton is pushed inwardly, notwithstanding that the keeper may tend to hold the fence in locking position due, for example, to over-packing of the luggage.

3,677,043

REMOTE CONTROL DOOR LOCK

Clifford B. Cox, 917 Buena Vista St., South Pasadena, Calif.

Filed Dec. 7, 1970, Ser. No. 95,781
Int. Cl. E05b 65/10, 47/06
U.S. Cl. 70—92 14 Claims



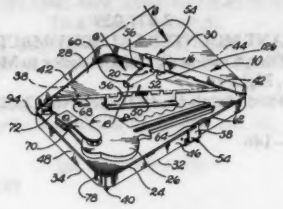
Apparatus for selectively locking and controllably releasing a panic exit door include a lock structure having a door locking position and a door release position and including a pair of vertical bars for locking the door at the top and bottom thereof. A manually actuable crash bar is located on one side of the door for actuating the lock, and a further manually actuable device for actuating the lock is located on the other side of the door. A remotely controllable device selectively blocks and releases the further manually actuable device, and a remote control selectively actuates the remotely controllable device.

3,677,044

KEYCASE

Paul T. De Frees, 321 Via Sol, Palm Springs, Calif.

Filed Oct. 5, 1970, Ser. No. 77,783
Int. Cl. A47g 29/10
U.S. Cl. 70—456 R 10 Claims



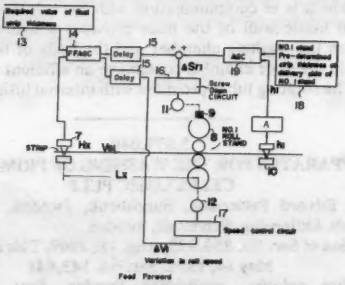
A thin, rectangular keycase divided into four substantially triangular compartments, each of which can be opened independently of the others. The top surface of each compartment is formed tactually distinct from the other compartments which in combination with a spring release and snap latching mechanism enables one-handed retrieval and return to the keycase of any selected key.

3,677,045

METHOD OF FEED-FORWARDLY CONTROLLING A TANDEM ROLLING MILL

Tohru Arimura; Masamoto Kamata; Morio Saito, all of Kawasaki-shi; Hiromu Suzuki, Chiba-shi, and Masakazu Iguchi, Tokyo, all of Japan, assignors to Nippon Kokan Kabishiki Kaisha

Filed Nov. 19, 1969, Ser. No. 877,927
Claims priority, application Japan, Nov. 19, 1968, 43/84198
Int. Cl. B21b 37/12
U.S. Cl. 72—8 10 Claims

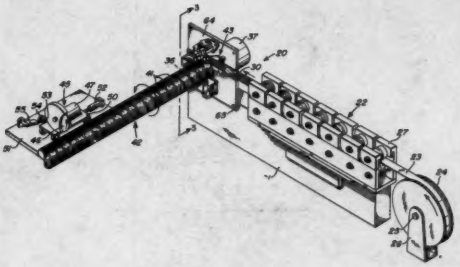


The thickness of the input material is measured at the entry side of the first roll stand and this value is related to the predetermined desired final thickness of the output material of the mill. The screw down mechanism of the first roll stand and the peripheral speed of the rolls of the first roll stand are then adjusted as a function of the measured and desired final thicknesses to produce an output strip having uniform thickness. The screw down and peripheral roll speeds are adjusted to maintain the incoming volumetric feed rate of the input material substantially constant.

3,677,046
APPARATUS FOR AND METHOD OF MANUFACTURING FLEXIBLE TUBING

Harold E. Carroll, Trotwood, Ohio, assignor to United McGill Corporation, Columbus, Ohio

Filed Sept. 10, 1970, Ser. No. 71,034
Int. Cl. B21f *11/00, 35/02*
U.S. Cl. 72—49 29 Claims

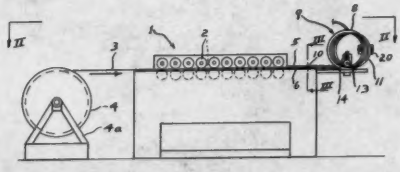


Flexible tubing is made from a continuous strip of material which has a roughly U-shaped portion along one side edge and a flange along an opposite side edge. A leading end portion of the strip is held against a rotatable support during rotation of the support enabling helical winding of the strip into a plurality of adjacent turns to define flexible tubing. Guide means guide the U-shaped portion so that it envelops the flange to define a seam and die means having stationary forming surfaces engage and change the cross-sectional configuration of the seam to interlock the U-shaped portion and flange together.

3,677,047
FORMING OF TUBULAR METAL DUCTING

Noel Victor Holyoake, 34 The Cresent, and David William Barr, 22a Abbot Road, Ngaio, both of Wellington, New Zealand

Filed April 1, 1970, Ser. No. 24,554
Claims priority, application New Zealand, April 3, 1969, 156043
Int. Cl. B21c *37/10*
U.S. Cl. 72—50 13 Claims

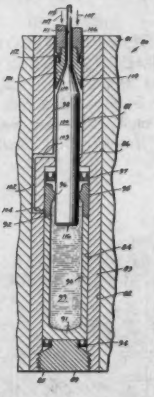


Apparatus for forming spiral lock seamed ducting from flat strip metal material, the apparatus employing or adapting a machine having at least one pair of driven lock forming rollers with co-operating peripheries and which are capable of drawing flat metal strip from a supply source and shaping opposite longitudinal edge portions of said strip so that one edge portion is capable of being interlocked with the other. In the present invention a circular forming head is provided at the output end of the lock forming machine and wit its axis transversely of and angled to the feed path of lock formed strip fed from the machine so that strip fed through an aperture in the forming head will follow a helical path in such forming head to emerge from one open end of the forming head as spiral formed tubular ducting, the angle of the forming head relative to the strip feed path determining the pitch of the helical path and providing that the leading edge portion of one circumvolution and the trailing edge portion of a preceding circumvolution will overlap. The forming head is provided with an inner curved forming member adjacent the strip inlet to the forming head and co-operating with an inner circumferential bearing surface of the forming head and disposed so that the strip passes between the forming member and the said bearing surface. A tuck-in member extends partly into the forming head adjacent the strip inlet thereto and is arranged to tuck or fold one edge portion of the strip into the opposite complementary shaped edge portion of the next circumvolution; in addition there is provided a compression means which can be in the form of a pair of co-operating rollers disposed so that overlapping edge portions of adjacent circumvolutions are passed therebetween and can be compressed to form a locked seam to the tubular ducting formed by the apparatus.

3,677,048
METHOD OF POSITIVE FLOW EXTRUSION

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company Incorporated, New York, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,677
Int. Cl. B21c *27/00*
U.S. Cl. 72—60 6 Claims



This disclosure is directed to a method for extruding a material to form a product, e.g., wire, wherein deformation of the material is accomplished by passing the material within a controlled flow of pressurized fluid, the pressure of which fluid deforms said material. Also disclosed, with respect to the extrusion of materials by exertion of pressures thereon, is a method for automatically varying the pressures in response to the resistance of the material to extrusion so as to maintain extrusion at a desired product discharge rate.

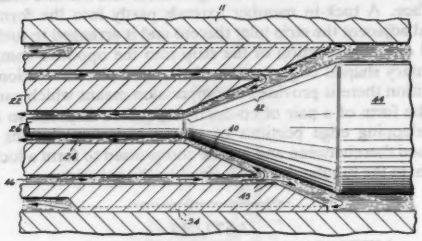
3,677,049
METHOD OF AND APPRATUS FOR POSITIVE FLUID FLOW EXTRUSION

John Sutton Cartwright, Pennington, and Francis Joseph Fuchs, Jr., Princeton Junction, both of N.J., assignors to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,751
Int. Cl. B21c *25/02*
U.S. Cl. 72—60 9 Claims

Method of and apparatus for extruding material, e.g., a billet, to form a product, e.g., wire, wherein deformation is accomplished by passing the material within a controlled flow of pressurized fluid, the pressure of which deforms the material.

Extrusion fluid is injected into the zone of deformation at maximum pressure and at the maximum pressure point for extruding material under controlled conditions to form a product.

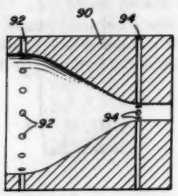


3,677,050

METHOD OF POSTIVE FLUID FLOW EXTRUSION AND OPTIMUM FLUID CONTROL ELEMENT THEREFOR

Nazeer Ahmed, New Brunswick, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,765
Int. Cl. B21c *25/02*
U.S. Cl. 72—60 **3 Claims**



The design and use of an optimum fluid control element for any positive fluid flow extrusion are set forth. The flow control surface of the fluid control element is sigmoidal with a critical clearance between the billet and the flow control surface occupied by pressurized fluid which exerts deformation pressures against the billet and accomplishes a portion of the work of deformation. The fluid occupies between about 3 and 10 percent of the cross-sectional area of the passage defined by the flow control surface through the fluid control element. Use of the fluid control element increases overall extrusion efficiency and homogeneous deformation is approached.

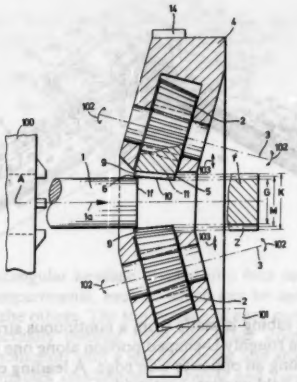
3,677,051

METHOD AND APPARATUS FOR ROLLING GEAR TEETH OR THE LIKE

Ernst Schmidt, Waldburgstr 40, Remagen, Germany

Filed May 7, 1970, Ser. No. 35,425
Claims priority, application Germany, May 12, 1969, P 19 24 067.6
Int. Cl. B21h *5/02*
U.S. Cl. 72—78 **11 Claims**

Cylindrical metallic blanks are provided with rolled gear teeth or splines by passing lengthwise between equidistant bevel gear shaped masters whose axes are inclined with reference to the axes of the blanks and which are mounted in a support arranged to orbit the masters about the axes of the blanks. The front end face of an advancing blank engages the teeth of the masters in the region of the larger-diameter ends of cones formed by the crowns of teeth on the masters and the outer diameters of annuli of teeth or splines formed by the masters exceed the diameters of the blanks. The masters are adjustable radially and/or angularly with reference to the axes of the blanks.

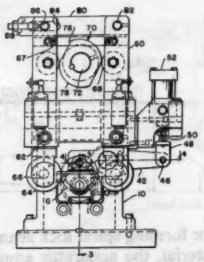


3,677,052

RING GEAR ROUNDER

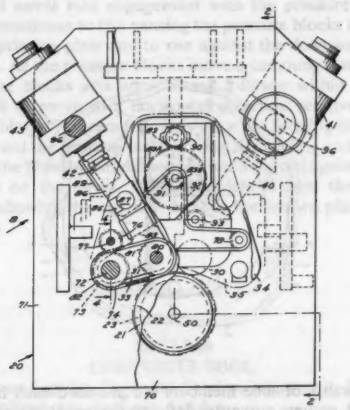
Russell W. Anthony, and Carl H. Motz, both of Harper Woods, Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 728,718, May 13, 1968, abandoned. This application May 1, 1970, Ser. No. 33,795
Int. Cl. B21h *5/00*
U.S. Cl. 72—107 **11 Claims**



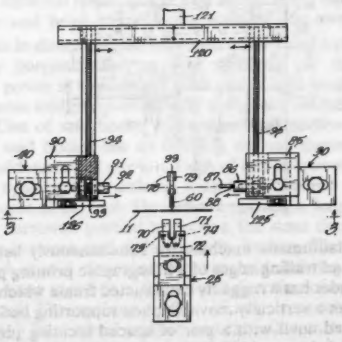
A combined ring gear rounder and gear tooth burnisher in which the gear is driven in rotation by a drive pinion, a burnishing pinion engages the gear teeth diametrically opposite to the drive pinion, means are provided for moving the burnishing pinion toward and away from the drive pinion to provide for loading and to provide burnishing pressure between the teeth of the burnishing pinion and ring gear. Rollers engaging the smooth side of the ring gear at opposite sides thereof at zones intermediate the drive and burnishing pinions are movable radially inwardly and outwardly with respect to the ring gear to effect ring rounding.

3,677,053
PLANISHING MACHINE
Walter L. Jewett, Royal Oak, Mich., assignor to Allied Welder Corporation, Detroit, Mich.
Filed Dec. 10, 1970, Ser. No. 96,698
Int. Cl. B21d *1/02*
U.S. Cl. 72—111 **6 Claims**



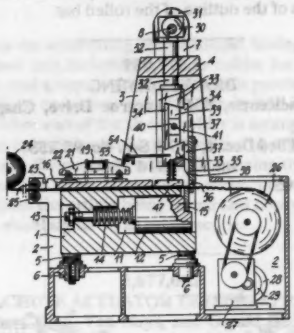
A planishing machine and process for reshaping parts wherein an anvil roll supports a brake shoe plate with a surface of the desired shape of plate. The anvil roll has a radial slot to receive the brake shoe web. Paired form rolls for ironing the plate against the anvil roll under force are swung on paired arms to advance and retract each form roll relative to the anvil roll. The form rolls are triangulated relative to each other and to the anvil roll and to avoid interference in the confined workpiece space and to provide separate control and power means to advance and retract each form roll. Coordinated drives turn the anvil roll and the form rolls at about the same peripheral surface speed.

3,677,054
METHOD OF FORMING A DOUBLE TORSION SPRING AND MACHINE THEREFOR
Edward S. Strzepek, Cicero, Ill., assignor to Lewis Spring & Manufacturing Co.
Filed June 23, 1970, Ser. No. 49,075
Int. Cl. B21f *3/027*
U.S. Cl. 72—131 **14 Claims**



A wire forming machine and method wherein a length of wire is cut and provided with a bow-shape at a coiling station by forming jaws moving relative to a forming arbor and with a pair of wire legs lying to either side of a stationary element at the coiling station. Right and left tool slides each carry a rotatable coiling head which is advanced into engagement with the wire legs and with catch pins on the coiling heads engaging and holding the wire whereby rotation of the coiling heads will form coils in each of the wire legs. The central bowed wire base is free to advance toward the coiling heads while being restrained against rotation whereby the lengths of wire to form the coils are provided by the advancing wire base, rather than by shortening of the free ends of the wire legs.

3,677,055
APPARATUS FOR MAKING SHAPED BORES IN A CONTINUOUS STRIP
Giuseppe Longhi, Via Volturno N° 5, Bergamo, Italy
Filed Feb. 1, 1971, Ser. No. 111,499
Claims priority, application Italy, April 29, 1970, 2918 A/70
Int. Cl. B21d *31/02*
U.S. Cl. 72—326 **4 Claims**

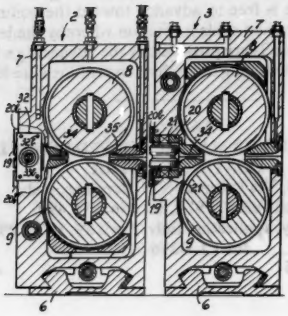


Apparatus for making shaped bores in a metal strip, comprising a base and a vertically alternating press, said strip being blockable therebetween. The base carries a cutting profile bar and the press carries a blade, the lower edge of which is tooth-shaped with a rather substantial thickness. During press downward movement, the blade cooperating with said bar, first shears off a series of separate aligned cuts in the strip and then the bar is moved away from the blade which, continuing its downward movement will deform by its teeth and stretch out the strip at said cuts. As the press along with the blade moves upwards, said bar moves back to operative position and urges the metal strip forward by one step.

3,677,056
MULTIPLE HOUSING ROLLING MILL
Ilario Properzi, Via Vittor Pisani 8, Milan, Italy
Filed May 26, 1970, Ser. No. 56,990
Claims priority, application Italy, May 27, 1969, 17403 A/69
Int. Cl. B21b *41/00, 13/08*
U.S. Cl. 72—227 **4 Claims**

A multiple housing rolling mill for obtaining shaped roll bars such as sector-shaped cores for electric cables including a rolling unit comprising two rollers having shaped grooves in the peripheral surface thereof, which have cross sections corresponding to opposite sections of the outline of the rolled

product to be obtained, and at least a pair of rollers with rotation axis at right angles to said two rollers. Grooves in the said

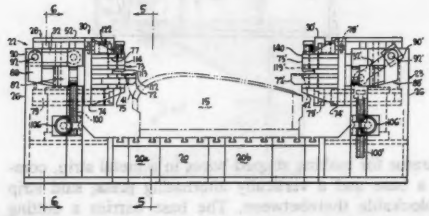


pair of rollers are shaped so as to correspond to remaining opposite sections of the outline of the rolled bar.

3,677,057
DRAW FORMING

Robert A. MacKenzie, 8351 Lucerne Drive, Chagrin Falls, Ohio

Filed Dec. 4, 1970, Ser. No. 95,253
Int. Cl. B21d *11/04*
U.S. Cl. 72—305 **13 Claims**

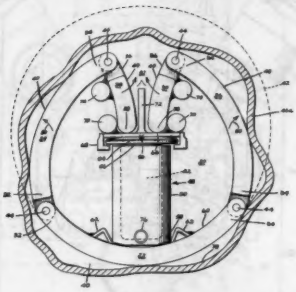


A stretch assembly or fixture for tensioning sheet metal stock in conjunction with draw forming. The stretch assembly supports the lower or bottom die member and has two upright stretch units, one on each of two opposite sides of the die. Each unit includes a work gripping head movable vertically relative to frame structure of the unit. A jaw assembly of each head is adapted to engage one of two opposite edges of a metal sheet to be formed and is movable relative to its head transversely of the vertical path of the head travel to stretch the sheet. Stretch links are pivotally connected between each jaw assembly and the frame structure of the respective stretch unit and move the jaw assemblies in a prescribed path transversely of the path of head travel in response to vertical movement of the gripping heads. The vertical position at which the links are pivoted on the stretch unit frame structure and the effective length of the links can be adjusted to control the movement of the gripping heads. The jaw assemblies include upper and lower jaw members. The upper members are supported for vertical movement to grip and release work and horizontal movement to expose the lower jaw to facilitate loading on extracting work.

3,677,058
APPARATUS AND METHOD FOR RESTORING DEFORMED ROLLS OF SHEET STOCK TO CYLINDRICAL SHAPE

James J. Van Gompel, Fremont, Ind., assignor to Brammall, Inc., Angola, Ind.

Filed Sept. 4, 1970, Ser. No. 69,791
Int. Cl. B21d *3/14*
U.S. Cl. 72—393 **21 Claims**

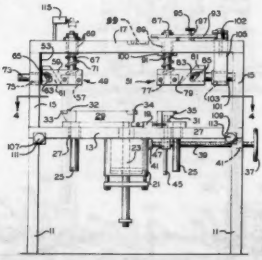


A plurality of shoe members are provided each having an outward, arcuate curvature defining a segment of a circle having a diameter generally equal to the inside diameter of an undeformed roll core. The shoe members are pivotally connected together in end-to-end relationship being thereby capable of pivotal expansion from a partially collapsed position to an expanded position with the shoe members generally lying on the circle. Power means is provided positioned between and acting outwardly upon at least two of the shoe members for respectively exerting outward force thereon thereby pivotally to expand the members so as to provide a cylindrical core and, in turn, a cylindrical roll.

3,677,059
LITHOPLATE BENDER

Leo H. Miller, Penfield, and James A. Colegrove, Rochester, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 19, 1971, Ser. No. 116,975
Int. Cl. B21d *5/01*
U.S. Cl. 72—403 **18 Claims**



A semiautomatic machine for simultaneously bending the leading and trailing edges of a lithographic printing plate. The plate bender has a ruggedly constructed frame which supports and guides a vertically movable plate supporting bed. The bed has a fixed anvil with a pair of spaced locating pins and an anvil which is movable relative to the fixed anvil to adapt the bender to bend different size printing plates. A fixed and movable pressure block are supported a short distance above

the fixed and movable anvils, respectively. Each of the pressure blocks has a spring biased vertically movable gripping face and a cam operated horizontally movable forming block. An adapter is also provided to enable the bender to shape lithographic plates smaller than the adjustable range of the bender.

In operation, a prepunched lithographic printing plate is positioned on the locating pins. The plate supporting bed is then driven vertically by a pneumatic cylinder to bring the plate and anvils into engagement with the pressure blocks. The bed continues to rise causing the pressure blocks to firmly grip the printing plate and to rise against the downward biasing force. As the pressure blocks move a camming slot at each end of the blocks acts upon a cam follower within the slot causing it to move in a horizontal direction relative to the pressure block. The cam followers draw the forming blocks inward toward the printing plate causing the leading and trailing edges of the plate to simultaneously bend inward against forming faces on the anvils. After the plate is bent the bed is lowered allowing the operator to slide the formed plate off of the anvils.

3,677,060

COMPOSITE TOOL

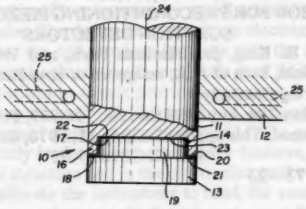
Kaj-Ragnar Loqvist, Fagersta, Sweden, assignor to Fagersta Bruks Aktiebolag, Fagersta, Sweden

Filed June 24, 1970, Ser. No. 49,314

Claims priority, application Sweden, June 27, 1969, 9220/69

Int. Cl. B21d *37/00*

U.S. Cl. 72—476 **12 Claims**



A composite working tool having a working surface and a desired direction of metal working and power transmitting movement comprising a composite composed of two bodies, each of a different metal; one of said metals being harder than the other and being the working surface. The two of said bodies are in direct contact with each other along a plane substantially perpendicular to said direction of movement whereby power is transmitted from one of said bodies to the other across said plane when said composite working tool is moved. One of said bodies has a narrowed portion and the other of said bodies has an opening defined therewithin to receive said narrowed portion. Each of said narrowed portion and said opening have defining walls in the desired direction of movement of the tool. The defined opening is larger in size than the narrowed portion to receive the same therein with clearance between said defining walls. Brazing filler metal is positioned in said clearance between said defining walls to bond the same together in the desired direction of movement of said tool. The working surface of said composite tool is preferably a hard metal carbide and the other metal of said tool is preferably a steel shank. The composite tool is preferably manufactured utilizing cooling of the steel shank when the hard solder is heated.

3,677,061

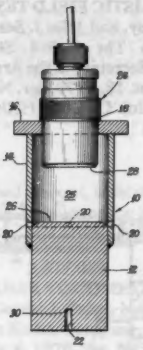
ULTRASONIC TEST STANDARD

Jan Visser, Elmhurst, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Feb. 10, 1971, Ser. No. 114,119

Int. Cl. G01c *25/00*; G01n *29/00*

U.S. Cl. 73—1 R **5 Claims**



A device for calibrating an ultrasonic testing machine. A test standard unit including a sleeve holder for an ultrasonic transducer and a standard test specimen is provided. The standard test piece closes one end of the sleeve and is secured to it also. The other end of the sleeve holder is arranged to slidably receive the transducer and hold it spaced at a predetermined distance from the standard test piece defining therebetween a water chamber. The transducer picks up sound signals reflected from the article being tested and converts the sound signal to a visual signal on an oscilloscope.

3,677,062

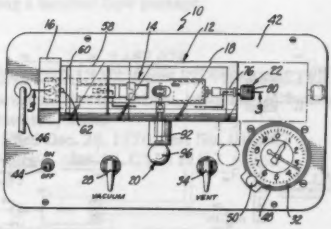
PARACHUTE ACTUATOR TESTING APPARATUS

James Robert King, Van Nuys, and Gerald D. Myers, Sepulveda, both of Calif., assignors to King Nutronics Corporation, Van Nuys, Calif.

Filed Jan. 28, 1971, Ser. No. 110,549

Int. Cl. 73 *432 SD*; G01x *27/00*

U.S. Cl. 73—4 R **6 Claims**



A testing apparatus for an altitude-sensitive parachute actuator, comprising an altitude chamber adapted to support the parachute actuator therein, a vacuum pump connected to the chamber, an on-off vacuum valve interposed between the pump and the chamber, an altimeter connected to the chamber to indicate the altitude therein, an on-off vent valve connected to the chamber to vent same to the atmosphere when open, and a vent restriction in series with the vent valve. The vent valve is a snap-acting toggle valve which can be closed substantially instantaneously when the parachute actuator is triggered so as to stop the altimeter at substantially the triggering altitude. The vent restriction is of a size to bleed

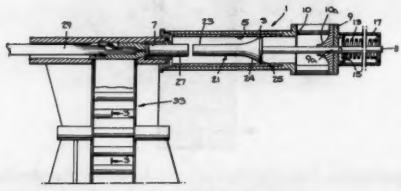
air into the chamber, when the vent valve is open, at a rate corresponding to the rate of descent of a parachutist in free fall, i.e., a rate of descent of the order of 100 to 250 feet per second, and preferably about 180 feet per second.

3,677,063

APPARATUS FOR LABORATORY SIMULATION OF BALLISTIC FIELD TESTING

Merrill Eig, Parsippany, and John J. Scavuzzo, Wayne, both of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Sept. 18, 1970, Ser. No. 73,323
Int. Cl. G01n *19/06*
U.S. Cl. 73—7 **15 Claims**



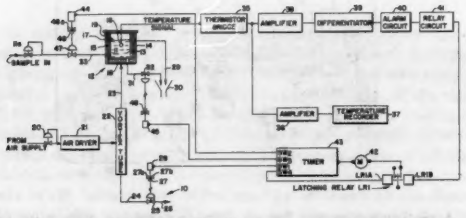
A laboratory test apparatus which duplicates conditions existing within a weapon barrel for testing weapon barrel materials without the need for actual field firing. The apparatus includes a support for a sample of the barrel material to be tested and a spring loaded piston which simulates actual firing conditions at the sample when a test charge is fired within the test apparatus. The charges preferably are formed to be completely consumed when fired which eliminates the need to eject a casing and which facilitates automatic loading into a breech in the sample support from a revolving drum which is driven in synchronism with reciprocating breech closure and charge firing members.

3,677,064

APPARATUS FOR AUTOMATIC CRYSTAL POINT DETECTION

Samuel W. Simpson, Florissant, Mo., assignor to Shell Oil Company, New York, N.Y.

Filed May 13, 1970, Ser. No. 36,836
Int. Cl. G01n *25/02*
U.S. Cl. 73—17 R **1 Claim**



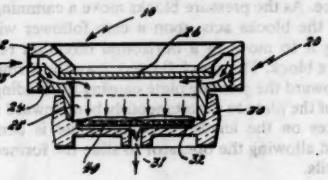
An apparatus for determining the crystal point of a sample of a normally liquid composition having constituents which crystallize upon being cooled by disposing the sample in a container and extending a temperature measuring device into contact with the sample. The sample is cooled while recording the change in temperature thereof on a cooling curve. The temperature of the sample is measured while detecting any changes in the slope of the cooling curve of the sample and the point on the cooling curve when the slope thereof approaches zero is recorded.

3,677,065

TRANSPARENT FLUID SAMPLER PERMITTING PARTICULATE ANALYSIS IN AN ASSEMBLED CONDITION

James G. Davis, Satellite Beach, Fla., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Oct. 14, 1970, Ser. No. 80,704
Int. Cl. G01n *15/02*
U.S. Cl. 73—28 **4 Claims**



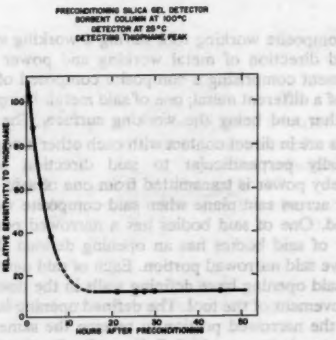
A fluid sampler having a cover assembly with an inlet and a transparent top and a cylinder-like bottom portion open at the upper end and closed at the lower end, except for an outlet. A suitable filter is disposed in the bottom portion over the outlet. The cover assembly and the bottom portion are removably connected and form a cavity. The fluid to be filtered is introduced into the fluid sampler through the inlet; enters the cavity; passes through the filter; and exits through the outlet. The contaminants are left on the filter and may be analyzed or counted by suitable means, such as a microscope, through the transparent top, without removal of the filter from the fluid sampler.

3,677,066

METHOD FOR PRECONDITIONING PIEZOELECTRIC SORPTION DETECTORS

William H. King, Jr., Florham Park, and Walter A. Dietz, Westfield, both of N.J., assignors to Esso Research and Engineering Company

Continuation-in-part of Ser. No. 798,089, Feb. 10, 1969, abandoned. This application July 31, 1970, Ser. No. 59,988
Int. Cl. G01n *29/02*
U.S. Cl. 73—23 **11 Claims**



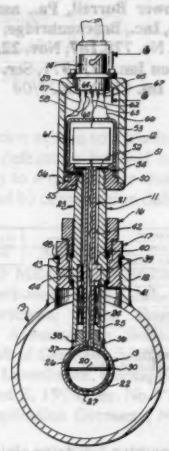
Highly sensitive sorption detectors are prepared from colloidal dispersions of high surface area porous materials. These sensitive sorption detectors are preconditioned by exposure to certain specified liquids. Preconditioning stabilizes the output signal of the detector making them particularly useful in measuring trace components in gas streams.

3,677,067

DENSITOMETER

Charles Eveleigh Miller, and Gerald Lance Schlatter, both of Boulder, Colo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 20, 1970, Ser. No. 65,371
Int. Cl. G01n 9/00
U.S. Cl. 73—32 30 Claims



A densitometer which utilizes a thin vane vibrated by a magnetostrictive tube. A piezoelectric crystal pickup feeds an amplifier and tracking filter to energize a coil around the magnetostrictive tube. The device is, in effect, an electromagnetic oscillator in that the coil is driven in phase with the detected signal. Vibration thus increases in amplitude until limited electrically. A linearization circuit provides an output D.C. voltage directly proportional to fluid density, gas, or liquid, which may be impressed upon a conventional D.C. voltmeter calibrated linearly in density. A great many features, both in the mechanical structure and in the electronics, make it possible to easily calibrate the instrument to read, for example, to within an accuracy tolerance of ± 0.1 percent over a fluid density range of, for example, from about 0.08 pounds per cubic foot to 80.0 pounds per cubic foot. Another outstanding advantage of the invention relates to a probe type construction which may be used in a pipeline of any size.

3,677,068

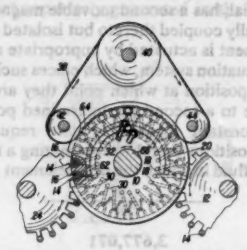
ARRANGEMENT FOR TESTING CIGARETTES

Alfred Schmermund, Postfach 144,, 5820 Gevelsberg, Westphalia, Germany

Filed March 5, 1971, Ser. No. 121,450
Claims priority, application Germany, March 17, 1970, P 20 12 647.0
Int. Cl. G01m 3/04
U.S. Cl. 73—41 12 Claims

A rotatably mounted drum provided with a plurality of axially extending troughs having openings disposed around the circumferential surface of the drum, is disclosed.

Cigarettes are fed radially into the openings as the drum rotates. The troughs are of such a depth that the cigarettes do not project above the drum surface, consequently, as the drum rotates in contact with a movable belt extending over an arcuate portion of its circumference, the troughs are closed while covered by the belt. While the troughs are so closed, air under pressure is injected into the closed troughs and a vacuum source is applied, via an axial bore in a piston pressed against the cigarettes' end surface, to the respective cigarette. The resulting air displacement, if any, is monitored and, where it exceeds a predetermined amount, indicating that the cigarette wrapping paper is faulty — the cigarette is rejected.

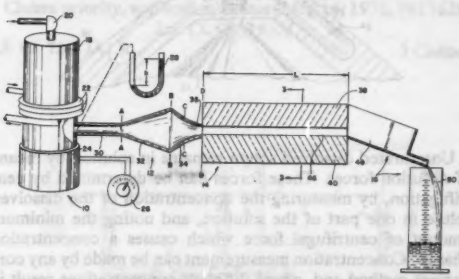


3,677,069

PLANAR VISCOMETER

Jacob C. Rubin, and Gerald J. Sukel, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 6, 1970, Ser. No. 61,595
Int. Cl. G01n 11/06
U.S. Cl. 73—56 8 Claims



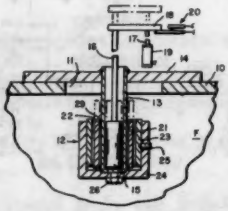
For measuring the viscosity of a thin planar film of fluid which may be simple, may contain solid particles in suspension, may be a mixture of several fluids, or may be any combination of these; a planar viscometer including (1) a mixing tank, (2) a planar flow generator including in series a long straight cylinder, a long diffuser, a short converging nozzle and a planar transition section of constant section, and (3) means forming a laminar flow passage.

3,677,070

MAGNETICALLY COUPLED VISCOMETER

Austin S. Norcross, Newton, Mass., assignor to Norcross Corporation, Newton, Mass.

Filed Dec. 28, 1970, Ser. No. 101,862
Int. Cl. G11n 11/12
U.S. Cl. 73—57 17 Claims



A viscosity measuring apparatus of the type in which a movable body element is caused to move within the fluid to be

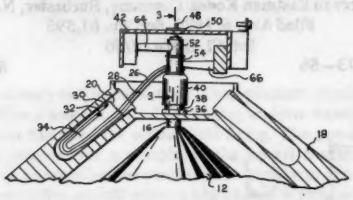
measured, the time period required to move the body a predetermined distance representing an index of the viscosity. A movable driven body element, at least partially made of a magnetic material, has a second movable magnetic driver element magnetically coupled thereto but isolated from the fluid. The driver element is actuated by appropriate means, such as a pneumatic actuation system, which places such elements in a predetermined position at which point they are released and caused to move to a second predetermined position under a substantially constant force, the time required to move between such positions thereby representing a measure of the viscosity of the fluid in which the drive element moves.

3,677,071

METHOD AND APPARATUS FOR DETERMINING THE COEFFICIENT OF DIFFUSION OF A DISSOLVED SOLUTE IN UNSATURATED SOLUTION

Arthur Seymon Martin, 2316 French St., Santa Ana, Calif.

Filed Nov. 12, 1970, Ser. No. 88,846
Int. Cl. G01n *27/06*
U.S. Cl. 73—61.4 **3 Claims**



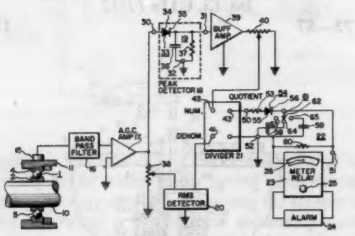
Unsaturated dissolved solute remains in solution by means of diffusion forces. These forces can be determined by centrifugation, by measuring the concentration of the dissolved solute in one part of the solution, and noting the minimum amount of centrifugal force which causes a concentration change. Concentration measurement can be made by any convenient method and, where different concentrations result in different electrical conductivity, resistance measurements are convenient.

3,677,072

DAMAGE DETECTION METHOD AND APPARATUS FOR MACHINE ELEMENTS UTILIZING VIBRATIONS THEREFROM

Bjorn Weichbrodt, and Bernard Darrel, both of Schenectady, N.Y., assignors to General Electric Company

Filed Oct. 30, 1970, Ser. No. 85,332
Int. Cl. G01n *29/00*
U.S. Cl. 73—67 **7 Claims**



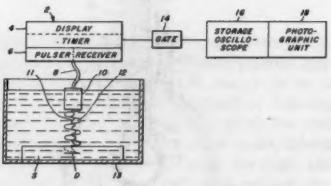
A system for detection of damage to a machine element in rolling engagement with another machine element utilizing vibrations produced by such damage. The peak value of the vibration signal obtained from the machine elements is compared with the mean value of the rectified vibration signal to obtain a ratio which is an indication of and the extent of the damage to the machine element.

3,677,073

METHOD AND APPARATUS FOR EVALUATING METAL CLEANLINESS

Jack B. Morgan, Lower Burrell, Pa., assignor to Allegheny Ludlum Industries, Inc., Brackenbridge, Pa.

Continuation of Ser. No. 778,187, Nov. 22, 1968, abandoned.
This application Jan. 27, 1971, Ser. No. 110,325
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.9 **4 Claims**



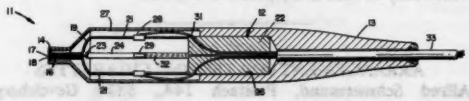
A method and apparatus for determining the presence, location and character of discontinuities in an otherwise homogeneous sample of material, e.g. a steel sample, by bombarding the sample with sonic energy in a controlled pattern, recording the reflection of energy from the sample and relating the reflection to locations on the sample.

3,677,074

TONOMETER PROBE FOR DIGITAL READ-OUT

William C. Murr, Piedmont, Calif., assignor to Berkeley Bio-Engineering, Inc., Berkeley, Calif.

Filed Feb. 1, 1971, Ser. No. 111,367
Int. Cl. A61b *3/16*
U.S. Cl. 73—80 **7 Claims**



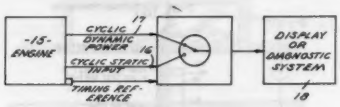
A tonometer probe having two concentric coplanar elements for contact with the surface of an eyeball, the elements being separately displaceable under the influence of applied force and respectively having associated force sensitive transducers for producing electrical signals representative of the applied forces acting on the respective elements. By virtue of the arrangement, the force signal afforded by the annular outer sensing element may be employed to provide information as to when the probe is accurately positioned against the eye and the central sensing element is recording force which is truly representative of that exerted by the internal environment of the eye and which then may be reliably converted to a digital reading for display or for direct input to a computer.

3,677,075

METHOD FOR THE DETECTION AND CLASSIFICATION OF DEFECTS IN INTERNAL COMBUSTION ENGINES

William Kenneth Scott, Royal Oak, Mich., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 20, 1970, Ser. No. 82,378
Int. Cl. G01m 15/00
U.S. Cl. 73—117.3 7 Claims



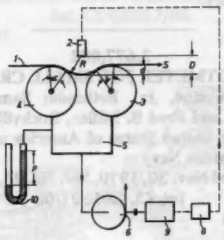
The present invention relates to a method for detecting and classifying cylinder defects in internal combustion engines, and more specifically to a method for classifying such defects into a) fuel system and b) compression defects.

3,677,076

METHOD OF MEASURING WEB TENSION

Peter Herzhoff, Leverkusen; Hans Gref, Cologne; Wolfgang Schweicher, Leverkusen; Hans Frenken, Leverkusen-Schlebusch; Peter Assenmacher, Schildgen, and Dietmar Westen, Opladen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 5, 1970, Ser. No. 77,908
Claims priority, application Germany, Nov. 15, 1969, P 19 57 485.7
Int. Cl. G01l 5/08
U.S. Cl. 73—144 3 Claims



The web tension of webs of material guided on rolls is measured and regulated to a constant value. For measuring the web tension, the web is sucked in between two rolls by means of a negative pressure and the curvature of the web resulting therefrom is used as measurement value for the web tension. As an alternative, the curvature of the web is kept constant and the negative pressure used for the sucking-in effect is used as measurement value for the web tension.

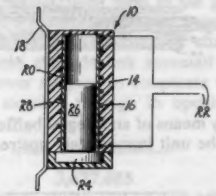
3,677,077

VIBRATION MONITORING SYSTEM

George B. Merryman, 7998 Via Roma Drive, Fair Oaks, Calif., and Joseph H. Merryman, P.O. Box 113, Meadow Vista, Calif.

Filed Jan. 7, 1971, Ser. No. 104,578
Int. Cl. G01m 17/00
U.S. Cl. 73—146 3 Claims

A vibration monitoring system particularly suited for use in isolating and measuring vibration of varying magnitudes simultaneously imparted to a plurality of mutually spaced locations defined on a moving vehicle. The system is characterized by a plurality of coiled electrical conductors, each being associated with a reciprocable soft iron core, about which exists a magnetic field, and coupled with a current measuring device through a manually operable selector switch, whereby current separately generated in the conductors, as



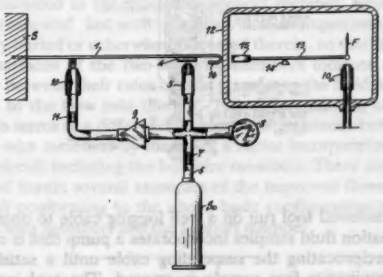
the cores are reciprocated in response to imposed vibratory motion, is measurable for thus providing intelligence indicative of the magnitude of the vibration imposed at any one of the spaced locations.

3,677,078

FLUIDIC-PNEUMATIC DEVICES WITH FORCES BALANCING

Claude Fernand Emile Larmurier, Paris, France, assignor to Compagnie Des Compteurs, Montrouse, France

Filed May 6, 1971, Ser. No. 140,746
Claims priority, application France, May 14, 1970, 7017625
Int. Cl. G01l 1/02
U.S. Cl. 73—141 R 3 Claims



Force balance comprising a beam placed inside an enclosure separated from the outer medium by means of a non-magnetic seal-tight wall in which the means for measuring the position deviation and for transmitting the rebalancing force are made by a fluidic regulating device having a blade provided on one end thereof with a magnetic mass cooperating through the seal-tight wall with another magnetic mass placed on one end of the beam.

3,677,079

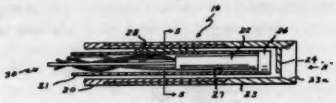
COMBINED STEADY-STATE/DYNAMIC TOTAL HEAD PROBE

Richard P. Hoeflinger, Palos Verdes Peninsula, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed May 21, 1970, Ser. No. 39,350
Int. Cl. G01m 9/00
U.S. Cl. 73—147 6 Claims

A combined, coaxial probe unit including a diffused diaphragm pressure transducer sensor device positioned within a larger outer tube and mountable within a wind tunnel test model for measuring both inlet total head and static pres-

sure. The sensor device is miniaturized and incorporates built-in protection against impact damage from contaminants in the stream flow by means of an integral baffle plate located in the tip of the probe unit immediately upstream from the sensor device.



3,677,080

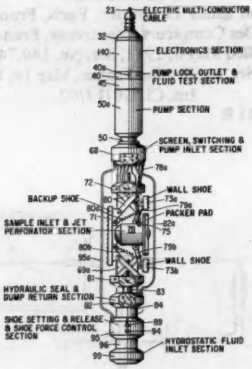
SIDEWALL WELL-FORMATION FLUID SAMPLER

Bobby Joe Hallmark, Fort Worth, Tex., assignor to Gearhart-Owen Industries, Inc., Fort Worth, Tex.

Filed June 16, 1971, Ser. No. 153,632

Int. Cl. E21b *49/00*

U.S. Cl. 73—155 **10 Claims**



A sidewall tool run on a well logging cable to obtain well-formation fluid samples incorporates a pump that is operated by reciprocating the suspending cable until a satisfactorily contamination-free sample is assured. The tool includes a number of features assuring reliable operation: shoe-setting force provided by hydrostatic pressure is regulated to be constant regardless of submergence; also, the regulated shoe-setting force is divided between large hold-down shoes and the pack-off pad so as not to overstress the mudcake or formation face; a reversible motor actuating a central control rod extending along the tool axis provides pump-locking, sample-sealing, and electrical-switching functions; alternate mechanical releasing operations are available in case of electrical malfunction; and pressure-balancing pistons prevent hydrostatic pressures from interfering with tool mechanical functions.

3,677,081

SIDEWALL WELL-FORMATION FLUID SAMPLER

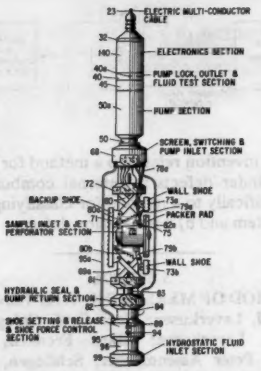
George R. Newton, and Alfred H. Jageler, both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed June 16, 1971, Ser. No. 153,633

Int. Cl. E21b *49/00*

U.S. Cl. 73—155 **5 Claims**

A sidewall tool run on a well logging cable to obtain well-formation fluid samples incorporates a pump that is operated by reciprocating the suspending cable until a satisfactorily contamination-free sample is assured. The conductors of the cable are used both for controlling the various functions of the tool and for telemetering pressure and fluid-character data to the ground surface for recording and/or for monitoring the sampling operation. As the pump suction is the primary agent for inducing sample flow from the formation and is thus completely controllable by manipulation of the logging cable, conventional means such as chokes, water cushions, and the



like, for regulating the sample flow rate are unnecessary. Chances of the tool becoming differentially stuck are minimized, as it is approximately centralized in the well bore by the retractable anchoring shoes and packer pad, and the latter can readily be broken free from its backing plate and left behind if necessary.

3,677,082

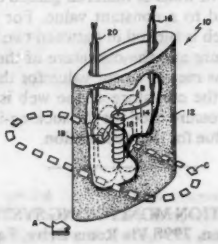
KNOTMETER FOR SMALL CRAFT

George B. Springston, Jr., Bethesda; Samuel L. Thomas, Gaithersburg, and Fred B. Miller, Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Nov. 30, 1970, Ser. No. 93,673

Int. Cl. G01c *21/00*

U.S. Cl. 73—181 **2 Claims**

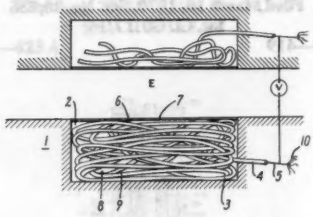


A regulated source of power is used to set up a magnetic field in the water around a rodmeter. The output is fed to an amplifier which in turn is connected to a ring demodulator which produces a pulsating D.C. voltage. A capacitor smoothes the D.C. output and feeds it to an integrating digital voltmeter to provide a display which is proportional to the average speed of the craft through the water.

3,677,083
ELECTRODE FOR MEASURING ALTERNATING VOLTAGES IN AN ELECTROLYTE

Johannes G. A. Van Breugel, Amstellaan 20, Heemstede, Netherlands

Filed May 22, 1970, Ser. No. 39,794
Int. Cl. G01f 1/00; G01p 5/08
U.S. Cl. 73—194 EM 6 Claims

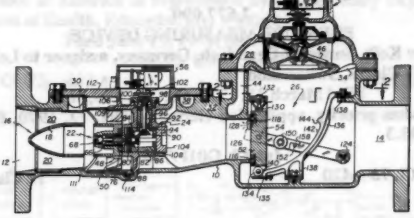


The invention relates to an electrode consisting of a conductor and adjacent to said conductor an electrolyt body, that contains copper ions. The electrolyt body is immobilized by a pervious structure, that may consist of a fine copper wire folded randomly in a recess containing the electrolyt body. Preferably the electrolyt body is bounded by a perforated plate.

3,677,084
COMPOUND FLUID METER

Narinder Masson, Jersey City; William John Korenicki, Linden, and Walter Ludwig Lechner, New Providence, all of N.J., assignors to Gamon-Camet Industries, Inc., Newark, N.J.

Filed March 27, 1970, Ser. No. 23,355
Int. Cl. G01f 7/00
U.S. Cl. 73—197 27 Claims

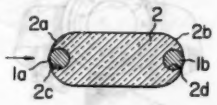


A compound fluid meter including a turbine type high flow metering device disposed in a main metering conduit, a low flow positive displacement metering device disposed in a bypass conduit connected to the main conduit, changeover valve means in said main conduit for preventing fluid flow therethrough when the fluid pressure is less than a predetermined pressure, the bypass conduit being adapted to receive fluid upstream from the valve means and reintroduce it downstream of the valve means, the turbine type high flow metering device comprising a fixed rod-like support member upon which an impeller is rotatably mounted, the rod-like support member having a free end extending towards the upstream end of the main conduit, a recess in said free end of the rod-like support member, a first thrust member loosely disposed in the recess and extending therefrom toward the upstream end of the main conduit, a ball-shaped thrust member and a recess in the hub of the impeller shaped to receive at least the free end of the rod-like support member with the first thrust member extending therefrom and the ball-shaped thrust member disposed between the upstream end of the hub recess and the first thrust member. Holes may be provided in the impeller for introducing the fluid being metered into the hub recess to lubricate and cool the relatively rotating elements therein. Further, face polarized annular permanent magnets are provided for coupling the impeller to an intermediate gear train and the intermediate gear train to the gearing of a register box to permit the intermediate gear train to be disposed in a fluid tight casing. Still further, the changeover valve means may comprise a toggle link mounted valve member having a cam follower adapted to cooperate with a cam for guiding the valve member through its opening and closing movements.

3,677,085
TANDEM-TYPE HOT-WIRE VELOCITY METER PROBE

Hideo Hayakawa, Yokohama, Japan, assignor to Yugen Kaisha Tsukasa Sokken, Tokyo, Japan

Filed April 8, 1970, Ser. No. 26,638
Int. Cl. G01f 1/00
U.S. Cl. 73—204 6 Claims

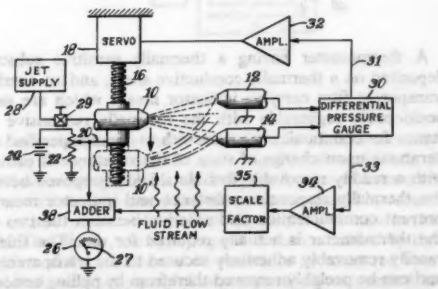


An improved tandem-type hot-wire velocity meter probe for the measurement of flow velocity of liquids and/or gases, comprising two hot-wire members disposed in tandem at upstream and downstream ends of an insulating support member placed in the flow path (e.g., a pipe or a conduit) of the fluid under measurement. The upstream or leading end hot-wire member has its downstream or trailing side buried or otherwise concealed in the insulating support member, while the downstream-end hot-wire member has its upstream side similarly buried or otherwise concealed therein, so that the exposed surfaces of the two hot-wire members indicate a difference between their rates of heat transfer to the fluid in proportion to the flow rate thereof. This difference can be obtained in terms of a difference in electrical resistance between the hot-wire members by means of a meter incorporated in a bridge circuit including the hot-wire members. There are also disclosed herein several examples of the improved flowmeter probe all conforming to the above basic configuration of the two hot-wire members and the support member.

3,677,086
MEASURING SYSTEM FOR A FLUID FLOW STREAM

Victor B. Corey, Bellevue, Wash., assignor to Sundstrand Data Control, Inc.

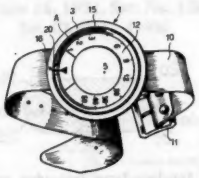
Filed June 10, 1970, Ser. No. 45,017
Int. Cl. G01p 5/00
U.S. Cl. 73—205 R 9 Claims



An apparatus for determining a characteristic, as velocity or direction, of a fluid flow stream. Fluid sensors generate signals

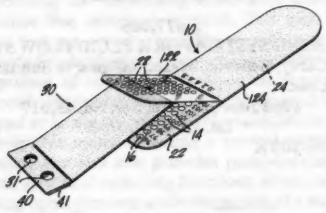
which are differentially compared to produce an error signal representative of the amount of movement, for the sensors or for a fluid stream generator, which is necessary to null the system. A servomechanism produces the nulling movement in response to the error signal. The amount of movement also generates a positional signal indicating the low frequency component or steady state characteristic of the fluid flow stream. A signal adder combines the positional signal with the error signal, containing a high frequency component, to provide an indication of the instantaneous fluid characteristic.

3,677,087
DEPTH GAUGES
Carlo Alinari, Corso Vittorio Emanuele 200, Turin, Italy
Filed Dec. 31, 1970, Ser. No. 103,095
Claims priority, application Italy, Jan. 2, 1970, 67003 A/70
Int. Cl. G01f 23/14
U.S. Cl. 73—300 **4 Claims**



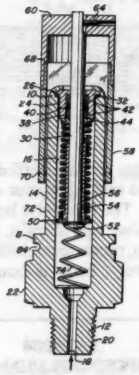
A depth gauge comprises a support of elastomeric material formed with an annular groove in which a thick-walled transparent gauge tube sealed at one end and open at its other end for access of water is snap mounted. Visual contrast between the water and air columns in the gauge tube is improved by the provision of a light-reflecting coating on an inclined portion of the support adjacent the groove receiving the gauge tube.

3,677,088
DISPOSABLE TYPE THERMOMETER
Robert A. Lang, East Hanover, N.J., assignor to Bio-Medical Sciences, Inc., Fairfield, N.J.
Filed March 4, 1971, Ser. No. 120,995
Int. Cl. G01k 11/08, 11/16
U.S. Cl. 73—356 **13 Claims**



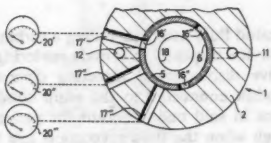
A thermometer having a thermally sensitive substance deposited on a thermally conductive sheet, and an overlying transparent film carrying indicator means which are superpositionably registrable with the thermally responsive substance for communicating therewith to denote specified temperatures upon change of state of the substance is provided with a readily removable flexible shield interposed between the thermally responsive substance and indicator means to prevent communication and reaction between the two until the thermometer is actually required for use. The shield is readily removably adhesively secured to the transparent film and can be peelably removed therefrom by pulling action applied digitally to a pull tab at one end of the shield. Concurrent with peeling of the shield from the transparent film, the latter is pressed against the thermally conductive sheet to position the indicator means in proper overlying communicating registration with the temperature responsive substance on the carrier sheet.

3,677,089
PRESSURE GAUGE
Clyde J. Martin, Cincinnati, Ohio, assignor to Martin Industries, Inc., Cincinnati, Ohio
Filed March 18, 1970, Ser. No. 20,736
Int. Cl. G01l 7/16
U.S. Cl. 73—419 **6 Claims**



The pressure gauge is characterized by extreme simplicity, and involves the use of a transparent cylindrical reciprocable window through which may be viewed from all angles such scale calibrations as are carried by the gauge body. A booster is provided to assure smooth and accurate operation, aided by lubricant-impregnated bearing elements.

3,677,090
PRESSURE MEASURING DEVICE
Dieter Kolb, Sutttgart-Degerloch, Germany, assignor to Lestra AG, Glarus, Switzerland
Filed March 31, 1971, Ser. No. 129,817
Claims priority, application Germany, Oct. 12, 1970, P 20 49 998.3
Int. Cl. G01l 7/00
U.S. Cl. 73—420 **12 Claims**



Apparatus for measuring and/or controlling pressures appearing in succession at the same measuring point has a cylinder arranged at a measuring point and defining a chamber. A piston defining a plurality of control passages is arranged in the cylinder chamber so as to be moved by successive pressures appearing at the measuring point. A measuring line is associated with each of the control passages defined in the piston. Means are provided for imparting a rotary control movement to the piston by means of the successive pressures and for consecutively connecting the measuring lines to the measuring point through at least one of the plurality of control

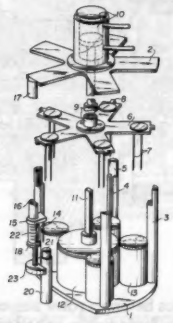
passages defined in the piston. The control movement imparting means may be a guide pin cooperating with a circumferential guide groove defined in the piston, or it may be two pairs of cooperating crown gears.

3,677,091

APPARATUS FOR TRANSFERRING LIQUIDS

Jean Guigan, Paris, France, assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed Aug. 27, 1970, Ser. No. 67,319
Int. Cl. G01n 1/14
U.S. Cl. 73—423 A 14 Claims



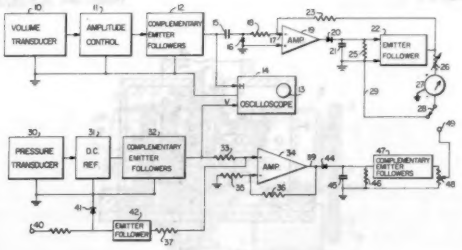
An apparatus for transferring a liquid via a liquid conducting means from a donor receptacle to a receiving receptacle, which includes cleaning and drying means for the liquid conducting means.

3,677,092

VOLUME METERING APPARATUS FOR CIRCULATORY ASSIST PUMPS

Henry R. Guarino, Revere, Mass., assignor to The United States of America as represented by the Secretary Department of Health, Education and Welfare

Filed June 17, 1970, Ser. No. 46,928
Int. Cl. G01d 5/14
U.S. Cl. 73—432 A 4 Claims



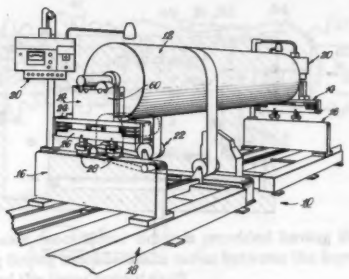
An electronic transient pulse operated volume metering circuit is disclosed which produces a visually readable volume indication derived from signals representative of the stroke of a blood pump in a circulatory assist system. Provisions are made for correcting the volume indication as a function of instantaneous pressure samples such as encountered in the patients circulatory system, and for visually presenting the relationship between the volume and pressure.

3,677,093

BALANCING HEADS FOR DYNAMIC BALANCING MACHINES

Paul D. Hutchings, Sr., Big Rapids, Mich., assignor to Hanchett Company, Big Rapids, Mich.

Filed Oct. 30, 1970, Ser. No. 85,452
Int. Cl. G01m 1/02
U.S. Cl. 73—473 8 Claims



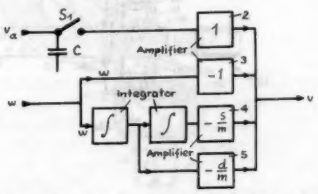
Balancing head used for supporting the opposite ends of a rotor being balanced in a dynamic balance machine constructed with a top head unit adapted to have a rectilinear reciprocatory motion relative to a fixed bottom head unit. A pair of hydrostatic bearings are provided between the top and bottom head units to reduce friction therebetween. A pair of magnetic devices are provided between the top and bottom head units to center the top head unit relative to the bottom head unit and to restrain the override horizontal movement of the top head unit.

3,677,094

METHOD OF PRODUCING A VOLTAGE EQUAL TO THE SPEED OF ROAD VEHICLES

Karl Kupfmuller, Darmstadt, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Jan. 18, 1971, Ser. No. 107,209
Int. Cl. G01p 7/00
U.S. Cl. 73—503 7 Claims

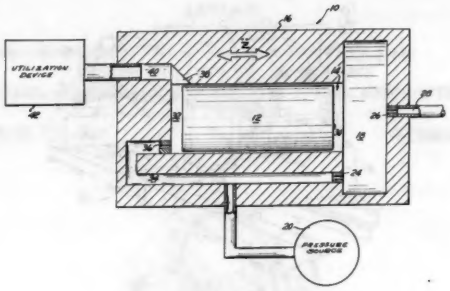


The instantaneous speed of a road vehicle is measured by measuring the speed derived from a number of revolutions of a wheel and adding thereto the integrated value of measured speed variations. The speed variations are measured by means of the relative motion of an elastically suspended mass in the vehicle. The, thusly, measured speed is then modified by the inclination of the vehicle and its variations as measured by a normal and an astatic pendulum, respectively suspended in the vehicle. These measurements are made during the braking to influence the braking process.

3,677,095
FLUID OSCILLATOR FOR A LINEAR OUTPUT ACCELEROMETER

Lael B. Taplin, Livonia, Mich., assignor to The Bendix Corporation

Filed Nov. 16, 1970, Ser. No. 89,669
Int. Cl. G01p 15/02
U.S. Cl. 73—515 6 Claims

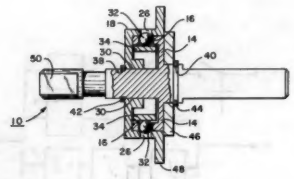


A fluid oscillator suitable for use as an accelerometer is described, comprised of a piston and cylinder housing with a constant pressure applied to one end of the piston and a pressure that is a function of piston position on the other, the resultant forces acting on the piston and its inertia causing the piston to oscillate in the cylinder at a frequency that varies linearly with the external acceleration of the unit along the axis of the piston. The varying frequency of the pressure pulses at the one end of the piston are utilized as a fluid pressure signal indicative of the level of such external acceleration.

3,677,096
MINIATURE INDEXING MECHANISM

Raymond G. Hatman, Lockport, N.Y., assignor to GTE Sylvania Incorporated

Filed June 1, 1971, Ser. No. 148,781
Int. Cl. G05g 5/06
U.S. Cl. 74—527 8 Claims

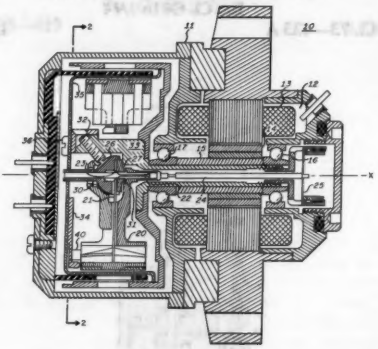


A miniature indexing mechanism employs a shaft of a first diameter having a drum of a second diameter, the second diameter being larger than the first. Two holes are located diametrically opposite each other in the walls of the drum. A hat shaped housing member includes a plurality of smaller holes circumferentially located along the inner wall thereof and has an internal diameter slightly larger than the drum section of the shaft such that the drum section is free to rotate within the wall of the housing member. Ball bearings are inserted in each of the two drum holes and are biased outwardly toward the inner walls of the housing member by a circular leaf spring. As the shaft is rotated, the bearings seat in the holes along the inner walls of the housing thus providing an indexing mechanism.

3,677,097
PROTECTIVE STOPS FOR A FLEXURE SUSPENDED GYROSCOPIC ROTOR

Thomas R. Quermann, Huntington Station, N.Y., assignor to Sperry Rand Corporation

Filed March 5, 1971, Ser. No. 121,424
Int. Cl. G01c 19/18
U.S. Cl. 74—5 5 Claims

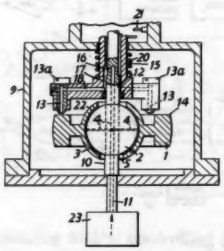


Gyroscopic apparatus having a rotor suspended by axial and radial flexure supports including a spherical shaped hub for limiting the translational deflection of the rotor with respect to a drive shaft, a plurality of leaf springs for limiting the relative angular deflection of the rotor with respect to the drive shaft and stop pins in combination with leaf springs for minimizing the relative rotational displacement of the drive shaft with respect to the rotor.

3,677,098
GYROSCOPE UNCAGING DEVICE

John Christopher Hammond Davis, Wargrave, England, assignor to Plessey Telecommunications Research Limited, Toplow, Great Britain

Filed Sept. 30, 1970, Ser. No. 76,666
Claims priority, application Great Britain, Oct. 11, 1969, 48,149/69
Int. Cl. G01c 19/26, 19/30
U.S. Cl. 74—5.12 5 Claims



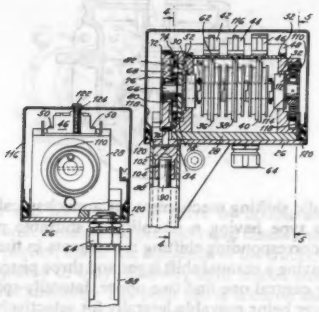
In order to minimize uncaging kicks on the rotor of a gyroscope device, the caging member acts on the rotor through air buffer means which, in air-bearing fashion, produce, during caging, aligning forces as a result of differences in the thickness of the air cushion. These forces rapidly decrease in size during uncaging by withdrawal of the caging member.

3,677,099

MACHINE CONTROL

Gordon H. Cork, Birmingham; David M. Tenniswood, Troy, and Robert E. Kaptur, Birmingham, all of Mich., assignors to Gemco Electric Company, Clawson, Mich.

Filed Sept. 9, 1970, Ser. No. 70,682
Int. Cl. F16h 27/02
U.S. Cl. 74—89.2 17 Claims



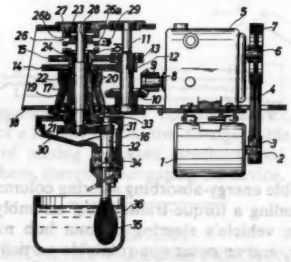
A machine controller for connection to a repetitively linearly movable part on the machine to be controlled, which machine includes means for controlling its operation, comprising a rotatably mounted cam shaft having cams for selectively actuating each of the machine's control means, and means coupled to said shaft and to the linearly moving machine part to translate linear machine movement into rotational movement. Spring means is operably coupled to the assembly biasing it to a normal at rest position corresponding to the start position of the machine being controlled.

3,677,100

MIXER

Tokuji Kajiwara, 13-13-2-chome, Matsugaya, Taito-ku, Tokyo, Japan

Filed Nov. 27, 1970, Ser. No. 92,981
Claims priority, application Japan, Aug. 19, 1970, 45/72610
Int. Cl. F16h 1/28
U.S. Cl. 74—660 1 Claim



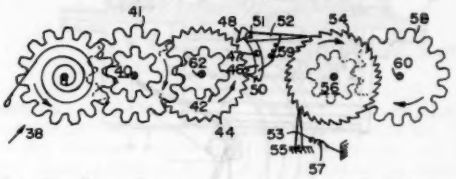
The present invention involves an apparatus for making a rolling circle of epicycloid or hypocycloid with an agitator driven by a single source so as to effectively form as many as possible mixtures, deriving from convective, diffusive or shear mixing, of baking ingredients in a container.

3,677,101

FAIL-SAFE MECHANICAL TIMER

Daniel Blitz, Boston, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 7, 1970, Ser. No. 61,958
Int. Cl. F16h 27/04
U.S. Cl. 74—112 14 Claims



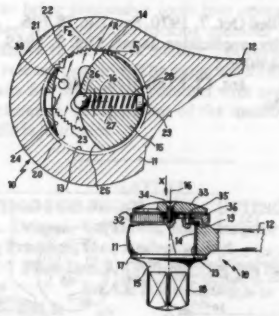
A fail-safe mechanical timer is provided having the speed retarding timing mechanism in series between the input power source and the timer output shaft.

3,677,102

FREE-WHEEL DEVICE FOR TRANSMITTING TORQUES AND REVERSIBLE RATCHET DOG COMPRISING SAME

Enrico Simonetta, Casale Litta, Italy, assignor to USAG S.p.A. Gemonio, Verese, Italy

Filed June 2, 1970, Ser. No. 42,788
Int. Cl. F16h 27/02
U.S. Cl. 74—143 4 Claims

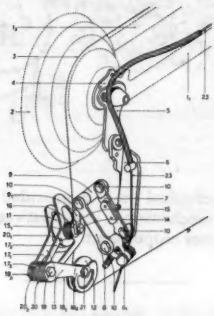


A free-wheel device and reversible ratchet dog comprising same, wherein an engagement between two torque transmitting elements is obtained in either directions of rotation by means of a pawl housed in a first torque transmitting element in such a manner that, when the device is acted upon, said pawl is submitted to dragging and reacting forces which resultant stresses the pawl into engaging relationship with the second torque transmitting element.

3,677,103
GEAR CHANGE FOR BICYCLE OR LIKE MACHINE

Jacques Andre Huret, and Roger Henri Huret, both of 60, Avenur Felix Faure, Nanterre, Haute de Seine, France

Filed Dec. 28, 1970, Ser. No. 101,557
Claims priority, application France, March 3, 1970, 7007559
Int. Cl. F16h 9/00
U.S. Cl. 74—217 B 6 Claims

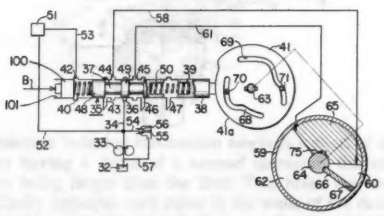


The invention relates to a gear change for bicycle or like machine comprising two rollers linked together by a support, movement of said unit being controlled cross-wise to the free wheel of the bicycle or like machine by means of a control wire, and the support linking the two rollers being made up of two parts articulated one on the other, a spring being positioned between these two parts in order to keep the two rollers constantly separated from each other.

3,677,104
SPEED CHANGE MECHANISM

Koichiro Hirozawa, and Tadao Asano, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Aichi, Japan

Filed Oct. 7, 1970, Ser. No. 78,706
Claims priority, application Japan, Oct. 7, 1969, 44/80051; Oct. 7, 1959, 44/80052
Int. Cl. F16h 5/48, 5/40
U.S. Cl. 74—336 7 Claims

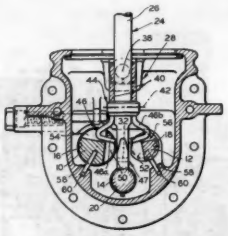


The usual shift collars in a speed change mechanism are operated by a plurality of shift forks. The shift forks are operable under the control of a cam disc having one or more cam grooves therein in which are located a plurality of control pins secured to each shift fork respectively. The cam disc is rotated by means of a hydraulic servo motor which is operable under the control of a vehicle speed responsive device.

3,677,105
HYDRAULIC SHIFTING MECHANISM FOR A MECHANICAL TRANSMISSION

Donald S. Dence, Brooklyn, Mich., assignor to Clark Equipment Company

Filed Sept. 14, 1970, Ser. No. 71,717
Int. Cl. G05g 5/10
U.S. Cl. 74—477 2 Claims

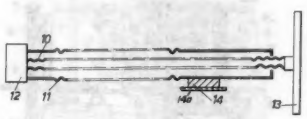


A hydraulic shifting mechanism for a mechanical transmission of the type having a plurality of shiftable pistons for producing corresponding shifting movements in the transmission, and having a manual shift lever and three pistons, including a lower central one and two upper, laterally-spaced ones, the shift lever being movable laterally for selectively engaging the pistons, and movable fore-and-back for shifting the selected piston; the shift lever has a lower end engageable with the selected piston, and is incorporated in a unit having side elements movable laterally with the shift lever but fixed against fore-and-back movement, the pistons having notches and grooves receiving the side elements; the side elements when the shift lever is in neutral or central position, respectively restrain the corresponding upper pistons against fore-and-back movement and when the shift lever is moved laterally in either direction, one of the side elements releases the corresponding upper piston and restrains the lower piston against fore-and-back movement, while the other side element continues to restrain its corresponding upper piston.

3,677,106
STEERING COLUMNS

James Henry Weston, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 21, 1970, Ser. No. 82,646
Claims priority, application Great Britain, Nov. 13, 1969, 55,593/69
Int. Cl. B62d 1/18
U.S. Cl. 74—492 8 Claims



A collapsible energy-absorbing steering column for a motor vehicle including a torque-transmitting assembly, connected between the vehicle's steering column hub mounting and steering box, and an outer non-rotatable partially-corrugated tube surrounding but rotatably separate from the torque-transmitting assembly, wherein the torque-transmitting assembly consists of or includes a corrugated tube designed to begin to collapse, on collision of the vehicle with another object, before the outer corrugated tube, the outer corrugated tube being designed to collapse at a predetermined rate and absorb substantially all of the collision impact energy.

3,677,107

PUSH ROD FOR A CRANK DRIVE MECHANISM

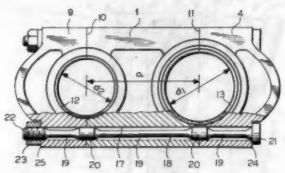
Albert Strebel, Binningen, and Oskar Habegger, Therwil, both of Switzerland, assignors to Maschinenfabrik Burckhardt AG, Basel, Switzerland

Filed June 25, 1970, Ser. No. 49,762

Claims priority, application Switzerland, June 27, 1969, 9913/69

Int. Cl. F16c *7/00*

U.S. Cl. 74—579 R **13 Claims**



A push rod for the crank drive of double-acting piston machines which makes simple and rapid disassembly possible. The shaft portion under the influence of the traction forces set up, is subjected to only relatively light tensile stressing or to compressive stressing. The push rod is secured assembled by anchoring screws with expanding shanks along its entire length and is subjected to alternating stressing, under the influence of a compressive stress which at least partially cancels the tensile stress set up during operation.

3,677,108

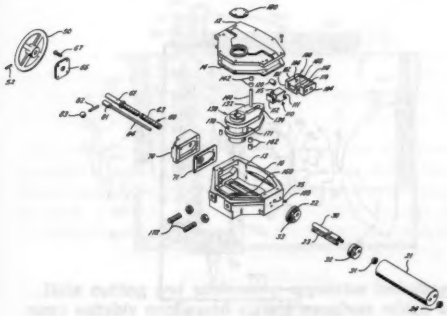
DISENGAGEABLE MANUAL CONTROL

Walter F. Prikryl, Houston, and Ronald A. Gulick, Sugarland, both of Tex., assignors to Research Engineering Company, Houston, Tex.

Filed Aug. 31, 1970, Ser. No. 68,427

Int. Cl. F16h *25/00*

U.S. Cl. 74—625 **9 Claims**



A disengageable, manually operable device for causing movement of a further object; the disengageable portion having a pair of mating threaded members, and facilities for separating them, thereby disengaging the device.

3,677,109

CONTINUOUSLY VARIABLE FRICTION GEAR

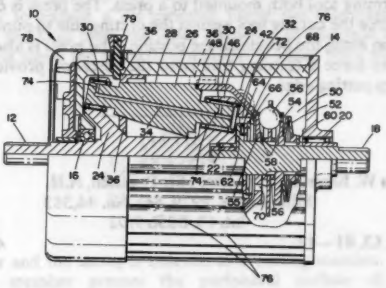
Robert E. Stuemky, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Jan. 14, 1971, Ser. No. 106,464

Int. Cl. F16h *15/50, 13/14, 57/04*

U.S. Cl. 74—796 **10 Claims**

A continuously variable friction gear of the planetary type having a plurality of double cone rollers so arranged that the top cone surface of each roller contacts an imaginary cylindrical surface. The rollers are epicyclically driven by a driver shaft. An internal rim wheel engages the bottom cone surface



of each roller and connects to a driven shaft. The gear is shifted between forward and reverse by a non-rotating shifting ring which engages the cylindrically aligned surface of the rollers.

3,677,110

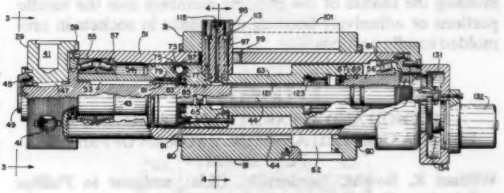
LATHE TURRET

Clement L. McIver, Sr., Wayland, Mass., assignor to Methods Incorporated, Sudbury, Mass.

Filed July 29, 1970, Ser. No. 59,048

Int. Cl. B23b *29/32*

U.S. Cl. 74—813 L **7 Claims**



In the lathe turret construction disclosed herein, indexing of the turret to bring successive tools into operating position is accomplished by a separate locking member which is axially slidable, relative to the turret spindle, between a locking position and a release position. The separate locking member includes means for preventing rotation with respect to a fixed frame of reference, independent of the member in which the turret spindle is journaled.

3,677,111

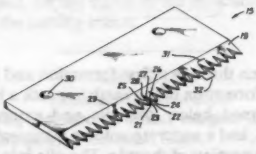
METHOD FOR PRODUCING CUTTING RULES

Sherman L. Dragoo, Yorktown, Ind., assignor to Corrugated Finishing Products, Inc., Anderson, Ind.

Filed Dec. 3, 1970, Ser. No. 94,729

Int. Cl. B21k *21/00*

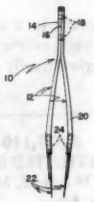
U.S. Cl. 76—101 R **6 Claims**



A method and apparatus for producing cutting rules. The cutting rule has a beveled edge portion with a serration

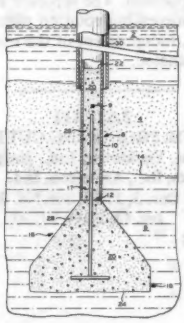
formed thereon. The serration has pointed teeth which are pressed to provide a sharp cutting edge. The apparatus for producing the cutting rule has a support block supporting the cutting rule blank which is positioned under a cutting tool and a forming tool both mounted to a press. The press is operable to force the cutting tool against the cutting rule to punch a serration along the beveled edge portion. The press is also operable to force a forming tool onto the serration providing the sharp cutting edge.

3,677,112
PINCERS
John W. Keniston, P. O. Box 151, Franklin, N.H.
Filed June 8, 1970, Ser. No. 44,353
Int. Cl. B25b *9/02*
U.S. Cl. 81—43 **4 Claims**



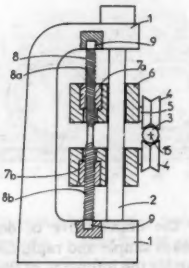
Pincers have a handle portion formed of plastic and gripping members formed of a different material adhesively united to the plastic of the handle portion. Methods include molding the shanks of the gripping members into the handle portions or adhesively bonding the shanks in sockets in premolded handle portions.

3,677,113
METHOD AND APPARATUS FOR FORMING A FOUNDATION-LEG ASSEMBLY FOR AN OFFSHORE PLATFORM
William R. Bowles, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Jan. 7, 1971, Ser. No. 104,606
Int. Cl. E02d *5/40, 5/44, 27/32*
U.S. Cl. 61—46 **13 Claims**



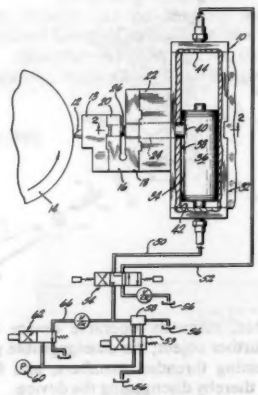
A pile is driven through a first formation and into a subterranean second formation of the earth beneath a body of water, a cavity is formed below the pile and extends outwardly beyond the pile, and a concrete volume is thereafter formed in the cavity and a portion of the pile. The pile is in intimate contact with the first and second formations and the concrete is in intimate sealing contact with the pile and the second formation.

3,677,114
POSITIONING THE WORK IN A MILLING LATHE
Claude Brochard, Dunkerque, and Rene Cossart, Coudekerque-Branche, both of France, assignors to Creusot-Loire, Paris, France
Filed Feb. 9, 1971, Ser. No. 113,830
Claims priority, application France, Feb. 11, 1970, 7004748
Int. Cl. B23b *13/00, 25/00*
U.S. Cl. 82—2.5 **5 Claims**



The driving rollers of a milling lathe are moved into driving position by symmetrical jacks and are interconnected by at least one screw having two threads of opposite pitch. The screw is rotated by a motor without longitudinal movement to move the rollers symmetrically toward or away from the axis of the work.

3,677,115
HYDRAULICALLY OPERATED TOOL COMPENSATOR UNIT
James A. Skrentner, Sterling Heights, Mich., assignor to La Salle Machine Tool, Inc., Warren, Mich.
Filed March 16, 1970, Ser. No. 19,898
Int. Cl. B23b *21/00*
U.S. Cl. 82—24 **3 Claims**



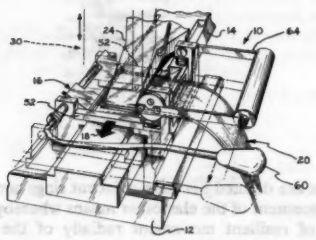
Hydraulically operated apparatus for periodically moving a machine tool to compensate for conditions such as tool wear and automatically maintain a pre-established position of the tool within predetermined tolerance limits. In response to a signal indicating the necessity for resetting the cutting tool to move it either toward or away from the work, a metering device admits a predetermined volume of fluid to a piston and cylinder assembly to provide for adjusted movement of the tool through a predetermined incremental distance.

3,677,116

BLANKING DEVICE FOR RIBBON CABLE

Quentin Berg, New Cumberland, Pa., and Jerry A. Kendall, Garland, Tex., assignors to Berg Electronics, Inc., New Cumberland, Pa.

Filed Aug. 5, 1970, Ser. No. 61,330
Int. Cl. B26f 1/44
U.S. Cl. 83—55 23 Claims



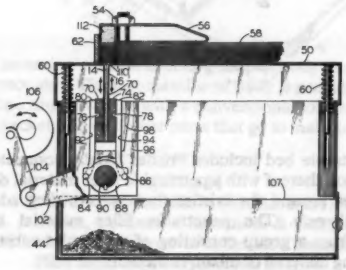
Apparatus and method for removing spacer material from between conductors in a ribbon cable. The spacer material is removed without injuring the conductors despite a cumulative spacing tolerance between the conductors. The apparatus successively feeds each conductor regardless of its position in the cable to a known location adjacent a punch and die so that the spacer material is removed without injuring the conductors.

3,677,117

MATERIAL CUTTING APPARATUS WITH RECIPROCATING CUTTING ELEMENTS

James W. Cutter, 276 Galli Drive, Los Altos, Calif.

Filed June 9, 1969, Ser. No. 831,375
Int. Cl. B26f 1/02, 1/14
U.S. Cl. 83—150 22 Claims



Hole cutting and perforating apparatus including one or more suitably configured cutting members which are comprised of two or more cutting elements that are alternately displaced relative to each other as they are caused to impact, perforate and pass through a given work material so that each cutting element independently cuts through a portion of the work material and the sum of the independent cuts forms the desired hole or cut out.

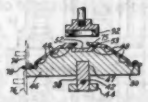
3,677,118

DIAPHRAGM TRIMMER

Malcolm K. Abbott, and David A. Dowdy, both of Toledo, Ohio, assignors to The Bendix Corporation

Filed Aug. 20, 1970, Ser. No. 65,552
Int. Cl. B26d 5/28
U.S. Cl. 83—211 10 Claims

A trimmer apparatus for removing flash from the inner diameter opening and the peripheral surface of a molded diaphragm. A molded diaphragm is placed on a rotatable fixture secured in a turret. Upon activation of an electrical switch the fixture is rotated to a press member station. In this location the turret is held stationary to allow a retractible member to engage a die member under the diaphragm to remove the flash from the inner diameter. In response to an operation signal the retractible member is raised from the die



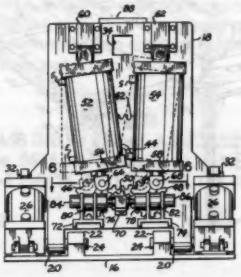
member and the turret is indexed to a cutting member. The cutting member presses the peripheral surface of the diaphragm against the fixture and is guided by the external surface of the diaphragm to simultaneously remove the flash from the outer edge of a diaphragm while the press member is in operation.

3,677,119

FLYING SHEAR

Julian S. Taylor, 8600 S.W. 8, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 774,112, Nov. 4, 1968. This application Oct. 5, 1970, Ser. No. 77,952
Int. Cl. B23d 25/06
U.S. Cl. 83—316 7 Claims



In a flying shear an upright frame is provided with an opening forming a passageway for moving stock to be cut. A stationary blade is mounted on the frame above the opening. A movable blade is reciprocably mounted on the frame for movement toward and away from the stationary blade by a pitman connected with a crank arm coaxially connected with a gear wheel journalled by the frame. Spaced-apart spur gears, mounted on the frame in mesh with the gear wheel, are respectively connected with and driven by a pair of power cylinders for moving the pitman in a to and fro stock cutting stroke in response to shear signal operated electrical and pressure responsive valve means connected with the power cylinders and a control operated cog wheel interposed between the spur gears. Frame connected tilting cylinders, energized with the shear signal, tilt the frame in the direction of stock movement during the cutting action.

3,677,120

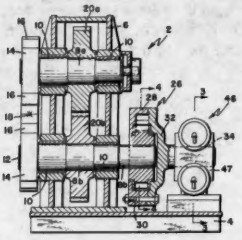
SHEAR MECHANISM

Donald Sieurin, Northboro, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Filed Aug. 6, 1970, Ser. No. 61,708
Int. Cl. B26d 1/56
U.S. Cl. 83—343 7 Claims

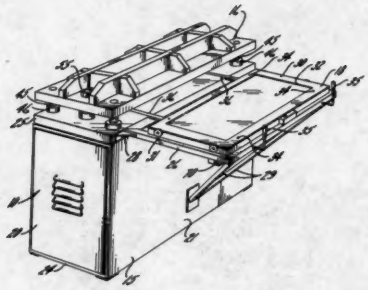
An apparatus for cutting a moving elongated element by

employing cooperative cutting blades mounted on spaced rotatable shafts. The shafts are interconnected by gear means



and are driven by a reciprocally operating drive mechanism acting through a one-way clutch assembly.

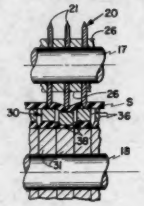
3,677,121
PRINTING PLATES IN REGISTRY
Gordon Etchell, Downers Grove, Ill., assignor to North American Rockwell Corporation, Pittsburgh, Pa.
Filed Oct. 13, 1970, Ser. No. 80,288
Int. Cl. B26d *7/06, 7/16*
U.S. Cl. 83—437 **10 Claims**



A machine for trimming flexible letter press printing plates to final size and simultaneously punching mounting appertures therein in accurate register with the plate image. The illustrated machine includes a vertically moveable die head and a die base plate with structure for supporting an untrimmed flexible printing plate in a predetermined position on the base plate. The die base plate is laterally moveable from an outwardly extended position to a determined position directly below the die head. When the die base plate is in proper position beneath the die head, selectively operable hydraulic actuating elements may lower the die head, into contact with the die base plate to trim and punch the flexible plate in finished form.

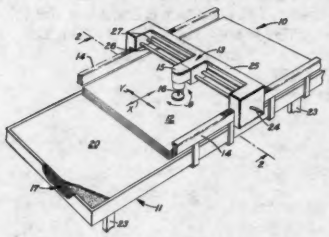
3,677,122
SLITTING APPARATUS HAVING INDEPENDENT RESILIENTLY SUPPORTED ANVIL MEANS
Donald E. Rautine, Erie, Pa., assignor to Lord Corporation, Erie, Pa.
Filed March 23, 1971, Ser. No. 127,097
Int. Cl. B23d *19/06*
U.S. Cl. 83—506 **5 Claims**

Anvil means for a slitting apparatus having a pair of parallel rotatable first and second arbors, and a plurality of slitting discs concentrically mounted and spaced axially along the first arbor for rotation therewith comprising a plurality of annular rings concentrically disposed axially along the second arbor and elastomer means disposed and adhered, preferably bonded, between each of the rings and second arbor and mounting each of the rings for rotation with the second arbor. The elastomer means resiliently hold each of the rings in preloaded rolling engagement with at least one of the discs. Bulge



free areas are defined between adjacent rings and provide for the displacement of the elastomer means whereby each ring is capable of resilient movement radially of the axis of the second arbor independently of each other.

3,677,123
PENETRABLE BED USED FOR CUTTING SHEET MATERIAL
Heinz Joseph Gerber, and David Raymond Pearl, both of West Hartford, Conn., assignors to Gerber Garment Technology Inc., East Hartford, Conn.
Filed Dec. 9, 1970, Ser. No. 96,385
Int. Cl. B26d *7/20*
U.S. Cl. 83—561 **13 Claims**

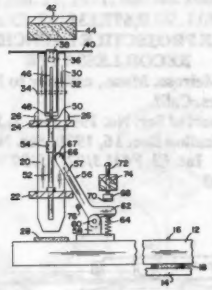


A penetrable bed includes bristles fixedly connected to a base portion thereof with a penetrable filler material disposed in the area around the bristles thereby providing additional support thereto. The penetrable filler material may be selected from a group consisting of a granular substance, a self-healing material or mixtures thereof.

3,677,124
HARPSICHORD WITH SUSTAIN MECHANISM
Walter F. O'Brien, Garrettsville, Ohio, assignor to Philip M. Cucchiara, Cleveland, Ohio, a part interest
Filed Aug. 19, 1970, Ser. No. 64,945
Int. Cl. G10c *1/06*
U.S. Cl. 84—258 **8 Claims**

A harpsichord having string plucking means consisting of a vertically moving jack and a plectrum carrying tongue pivotally mounted at the upper end of the jack. A control rod or lever means is associated with each jack and is operated by the same key as the associated jack. The control rod causes the tongue to pivot bringing the plectrum into string plucking position before the jack is raised by the key action. After the string is plucked, the control rod actuating arrangement permits the rod to drop to its rest position before the jack falls thereby preventing the rod from interfering with the retracted position of the tongue and plectrum away from the string.

retraction having occurred when the string was plucked. Hence, when the jack drops, neither the plectrum nor its associated buffer contacts the strings until the key is again



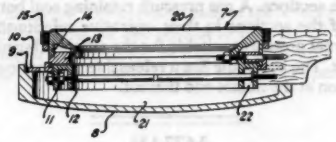
depressed. Blocking means are provided for holding the plectrum carrying tongue in its rest position when it is desired to use a different register of jacks.

3,677,125

BANJO HAVING COMBINATION BANJO BODY AND TONE RINGS

Maywood Oliver, 150 Chestnut Ave., Carlisle, Ohio

Filed Nov. 17, 1970, Ser. No. 90,293
Int. Cl. G10c *1/10*
U.S. Cl. 84—271 **2 Claims**



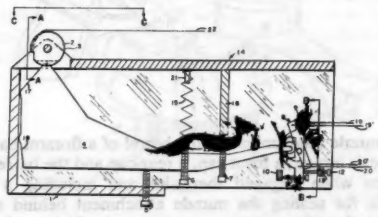
This invention consists of a ring-shaped body mounted in a metal resonator. The just-mentioned body is provided with an inner tone ring as well as with a conventional tone ring and an upper bracket ring and other parts that go to make up a banjo.

3,677,126

APPARATUS FOR STRINGED MUSICAL INSTRUMENTS

Victor F. J. Pierce, c/o Lennox Associates & Company, Room 5, 1161 Melville St., Vancouver 5, British Columbia, Canada

Filed Sept. 29, 1969, Ser. No. 861,946
Int. Cl. G10d *3/14*
U.S. Cl. 84—312 **3 Claims**



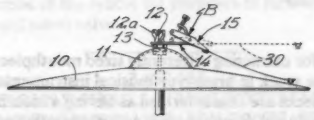
The strings of stringed musical instruments are changed in length to vary their tension through a multiple musical note range for each respective string. In one embodiment foot pedal movements of mechanisms are transferred to the vicinity of string ends to rotate pivot pullers which in turn controllably move respective lever arms, between adjustable stop limitations. The lever arms are secured to disc tighteners to which the string ends are secured. Lever arm movements oscillate the disc tighteners to increase and decrease the string tension to respectively raise and lower the musical pitch of the strings. In another embodiment translating pullers are used in lieu of pivot pullers to controllably move another type of lever arm.

3,677,127

CYMBAL ATTACHMENT

Ernest H. Garven, 6608 Ridgeview Drive, Edina, Minn.

Filed Sept. 8, 1970, Ser. No. 70,081
Int. Cl. G10d *13/08*
U.S. Cl. 84—402 **7 Claims**



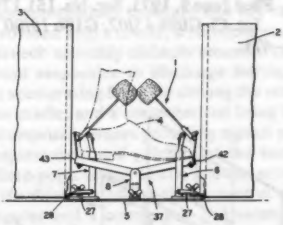
A cymbal attachment includes a fixed bracket secured to the cymbal mounting bolt, and a second bracket secured to the fixed bracket. The second bracket supports a number of spring arms having weighted cymbal engaging ends. In one position the weighted arm ends engage the cymbal surface, and in another position the arm ends are held spaced from the symbol surface in inoperative position.

3,677,128

BASS DRUM PEDAL ASSEMBLY

Allan R. Simpson, 5656 Springlake Road N.W., Canton, Ohio

Filed July 26, 1971, Ser. No. 165,485
Int. Cl. G10d *13/00*
U.S. Cl. 84—422 **8 Claims**

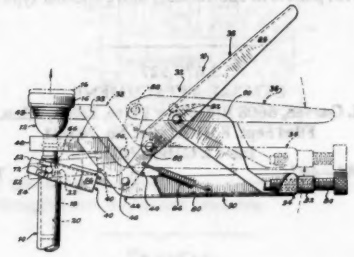


A drum pedal assembly having a pair of drum beater standards mounted on opposite ends of a base and having a drum beater operatively held by each standard. A vertical support is mounted on the base intermediate the pair of standards and pivotally mounts adjacent ends of a pair of foot pedals. The foot pedals extend outward from the pivot support in opposite directions and the swinging ends of the foot pedals are operatively connected to the drum beaters. The pair of foot pedals forms a split pedal that may be operated by a drummer's foot selectively to strike in any sequence either or both of a pair of bass drums, located at the ends of the base opposite the standards, by downward movement of the heel or toe portion of the foot.

3,677,129
DEVICE FOR EXTRACTING MOUTHPIECES FROM MUSICAL INSTRUMENTS

Archie L. Lyon, 482 Lamarch Drive, Cheektowaga, N.Y.

Filed Jan. 7, 1971, Ser. No. 104,591
Int. Cl. G10g 7/00; B25b 7/12
U.S. Cl. 84—453 10 Claims

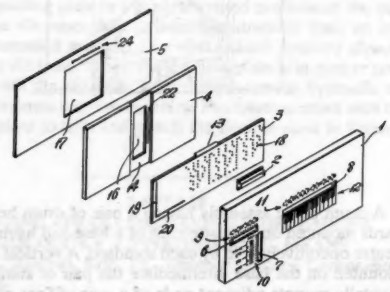


A device for extracting differently sized mouthpieces, which have become stuck in brass type musical instruments, wherein the mouthpieces are characterized as having a mouth end portion and a reduced diameter stem end portion dimensioned to be slip-friction fitted into an end of the musical instrument. The device includes a pair of pivotally joined lever devices, each having jaw end portions and operating end portions, the latter when moved towards one another forcing the jaw end portions to move apart for the purpose of extracting the mouthpiece from the instrument. One of the jaw end portions is configured to freely receive the stem end portion and engage beneath the mouthpiece end portion, whereas the other jaw end portion carries a pair of spreader members, which serve to removably grip the stem end portion and bear against an end surface of the instrument. The spreader members are automatically adjustable relative to their associated jaw end portion in order to prevent binding of the stem end portion within the instrument during the extraction operation.

3,677,130
CHORD TEACHING DEVICE

Michael G. Petreycik, 510 Lake Ave, Bridgeport, Conn.

Filed June 9, 1971, Ser. No. 151,178
Int. Cl. G09b 15/02; G10b 15/00
U.S. Cl. 84—471 8 Claims

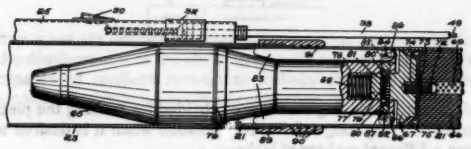


A device for the automatic selection and display of chromatic seals notes and relative keyboard keys corresponding to any preselected major scale or type of chord and any preselected name of major scale or chord whereby the name and type of scale or chord, as well as roots and inversions thereof, can be dialed to identify the corresponding notes and keyboard keys, or, conversely, the desired range of notes and keyboard keys can be dialed to identify the name of the major scale and the name and type of chord, as well as roots and inversions, corresponding to those chromatic notes and keyboard keys.

3,677,131
DISPOSABLE PROJECTILE LAUNCHER OF THE RECOILLESS TYPE

Michael A. Nee, Melrose, Mass., assignor to Norris Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 199, Jan. 2, 1970, abandoned.
This application Dec. 16, 1970, Ser. No. 98,662
Int. Cl. F41f 3/02, 15/00
U.S. Cl. 89—1.703 33 Claims

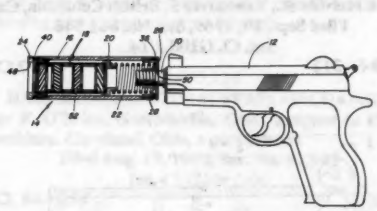


A disposable projectile launcher is disclosed in which a round of ammunition includes a tubular case section having a nozzle and enclosing a projectile and a propellant charge and slidably fitting within the rear end of a launcher section so that the two sections can have a shortened, inoperative relationship and an extended, operative relationship. Firing means are connected to the round and include a trigger carried by the launcher section and operable only in the operative relationship of the sections. A gas pressure retaining seal between the overlap of the sections in their operative relationship maintains internal pressures suitable for the efficient burning of the propellant. The projectile has a releasable connection with the case section at the nozzle end thereof.

3,677,132
WATERPROOF SOUND, FLASH AND RECOIL SUPPRESSOR FOR FIREARMS

Richard D. Plenge, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 5, 1969, Ser. No. 849,276
Int. Cl. F41c 21/18
U.S. Cl. 89—14 B 5 Claims



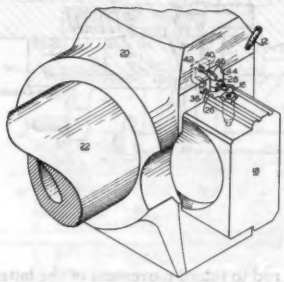
A muzzle attachment for the barrel of a firearm having O-ring seals around a front cap, a rear cap and the barrel of the firearm when engaged therewith and including a device therein for sealing the muzzle attachment behind a bullet passing therethrough to prevent escape of expanding gases therein propelling the bullet and an expansion chamber about the device. A chamber plug positionable in the firearm chamber makes the weapon waterproof from the chamber to the front cap of the muzzle attachment.

3,677,133

EXTRACTOR FOR PRIMER CARTRIDGE CASES

Donald F. Bushey, Watervliet, N.Y., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 21, 1971, Ser. No. 108,544
Int. Cl. F41f *13/12, 11/02, 11/04*
U.S. Cl. 89—27 B 9 Claims



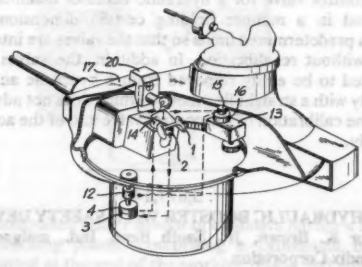
In large caliber guns which utilize rimless primer cartridges to ignite a separately loaded propellant charge, the required mating engagement between the extractor and the cannelure in the rimless end of the cartridge case is achieved by dividing the extractor into a pair of juxtaposed levers terminating in arcuate ends forming a U-shaped opening of slightly smaller diameter than the firing chamber but in axial alignment therewith. The levers are pivotally joined at a common point and are provided with a spring therebetween for urging the arcuate ends into the cannelure of the cartridge case following the insertion thereof through the U-shaped opening and into the firing chamber. The opposite ends of the levers are pivoted for movement about an axis normal to the vertical axis of the firing chamber in position to be cammed outwardly thereof to extract the cartridge case therefrom during the opening of the breech.

3,677,134

GUNNERY CONTROL DEVICE FOR TURRET-MOUNTED FIREARM

Jacques Paul Robert Maximi, Tarbes, and Andre Bernard Maurel, Aureilhan, both of France, assignors to Etat Francais, Paris, France

Filed March 30, 1970, Ser. No. 23,845
Claims priority, application France, March 31, 1969, 6909569
Int. Cl. F41g *3/22*
U.S. Cl. 89—41 E 6 Claims



Device to give accurate information as to angular velocity of the turret and automatic interpolation of the tachometric and ballistic corrections dependent on speed, target distance and ballistic parameters in both the laying and sighting of the weapon so that the line of sight is held on target without any personal manipulation by the gun controller.

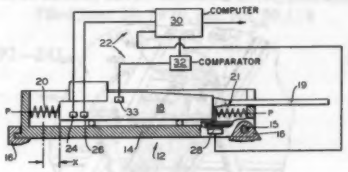
A turret is driven through a reduction gear box by a hydraulic engine controlled by a servo valve. There is connected to the turret through the reduction gearbox a device including a stator and a rotor, the relative shift between the stator which is connected to the turret and the rotor being used to control in part the servo valve controlling the hydraulic engine driving the turret. The aforesaid rotor is connected to a cylinder driven by a rotating disk at a controllable variable speed inasmuch as the roller is coupled to the disk by displaceable balls which are displaceable diametrally along the disk. The position of the balls between the roller and the disk is controlled through a servo motor in turn controlled by a potentiometer responding to the laying device for the associated gun. A potentiometer indicates the position of the balls between the disk and roller and this information is fed to a potentiometer which is also provided with a signal representing the time required for a projectile to travel to a specific target. The resulting signal is fed to a reticle control in the associated sighting device and a signal is generated indicating the correction of the reticle for purposes of further controlling the aforesaid servo valve.

3,677,135

MACHINE GUN HAVING A FIRING SYSTEM MEANS FOR OBTAINING SUBSTANTIALLY CONSTANT AND MINIMUM RECOIL FORCES

Edward J. Haug, Jr., Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army

Filed Nov. 19, 1969, Ser. No. 878,120
Int. Cl. F41f *19/10*
U.S. Cl. 89—42 B 5 Claims



A machine gun in which the recoil forces produced during a firing burst are substantially constant and are reduced to a minimum is provided with a cradle, a recoiling mass including a barrel and breech assembly slidingly mounted on the cradle for displacement responsive to discharge forces, a substantially constant accelerating force for driving the recoiling mass forward on the cradle, and a computerized firing system. The firing system comprises sensors providing signals proportional to forward displacement and velocity of the recoiling mass relative to a fixed point on the cradle and the acceleration of the cradle in the direction of fire with a control device comprising a computer and a comparator programmed to fire a round, responsive to signals from the sensors, at a point of time when the forward displacement and velocity of the recoiling mass and the acceleration of the cradle have values such that when a round is fired the impulse imparted to the recoiling mass is sufficient to drive the recoiling mass rearwardly to a reference point where its velocity will be zero.

3,677,136

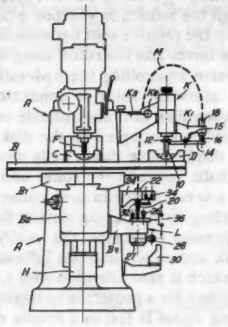
MASTER FOR MACHINE TOOLS, PARTICULARLY FOR MILLING MACHINES, TO REMOVE METAL BY LEVEL LAYERS

Angelo Girola, Via Alba 18, Busto Arsizio, Italy

Filed Dec. 29, 1969, Ser. No. 888,364
Int. Cl. B23q *35/04*
U.S. Cl. 90—62 10 Claims

The tracer point of the master is operatively connected with

adjustable stops, which in accordance with the profile to be performed interfere to displace the workpiece in a constant



direction and independently from the profile to be reproduced presented by the template.

3,677,137

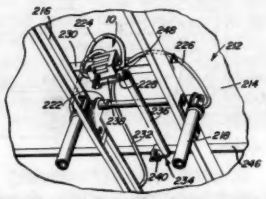
REVERSIBLE DIFFERENTIAL CONTROL VALVE AND SYSTEMS

Orville E. Stockwell, 536 First Ave., Greybull, Wyo.

Filed June 19, 1970, Ser. No. 47,831

Int. Cl. F01b *25/04*; F15b *15/22*

U.S. Cl. 91—6 **22 Claims**



Unequal loading of two or more fluid motor devices simultaneously imparting movement to a load, is sensed by torsional stress of a torque tube to actuate a differential valve assembly controlling flow of fluid between a pressure source and the fluid motor devices. A valve plunger actuated by the torque tube changes the flow paths within the body of the valve assembly under control of check valves to thereby compensate for unequal loading of the fluid motor devices.

3,677,138

MECHANISM FOR HYDRAULIC BRAKE BOOSTER

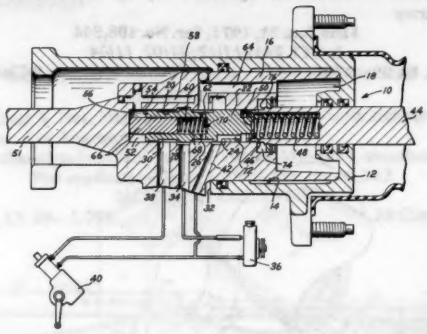
Edward J. Goscenski, Marshall, Mich., assignor to The Bendix Corporation

Filed Nov. 19, 1970, Ser. No. 90,930

Int. Cl. F15b *9/10*

U.S. Cl. 91—373 **7 Claims**

A hydraulic brake booster is disclosed which includes a boost piston slidably mounted in a housing. A spool valve is slidably mounted in the piston and is shiftable from a first position venting the housing to a fluid reservoir to a second position communicating the housing with a pressure source. An operator-actuated input rod engages one end of the spool valve for shifting the latter. A compartment in the other end of the spool valve is communicated to the pressure source as the valve is shifted. A sliding plunger extends from the compartment to pressurize the fluid received in the latter whereby the force due to fluid pressure in the compartment is transmitted



to the actuating rod to retard movement of the latter thereby providing braking "feel" to the vehicle operator.

3,677,139

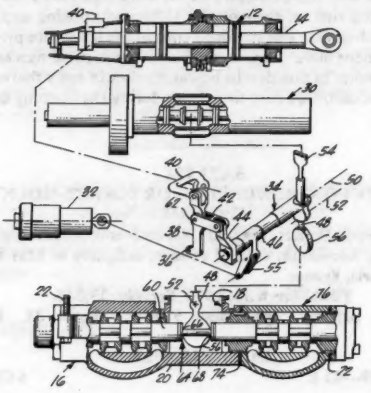
LINE REPLACEABLE UNIT CONTROL VALVE

Mildred S. Wheeler, Long Beach, Calif., assignor to McDonnell Douglas Corporation

Filed July 13, 1970, Ser. No. 54,197

Int. Cl. F15b *9/10*

U.S. Cl. 91—384 **4 Claims**



A control valve for a hydraulic actuator assembly is constructed in a manner holding certain dimensions therein within predetermined limits so that the valves are interchangeable without recalibration. In addition, the valves are constructed to be easily removed from a hydraulic actuator assembly with a straight line motion which does not adversely effect the calibration of the control valve and of the actuator assembly.

3,677,140

HYDRAULIC BOOSTER WITH SAFETY DEVICE

Arthur K. Brown, Jr., South Bend, Ind., assignor to The Bendix Corporation

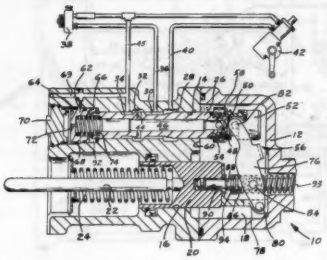
Filed Nov. 23, 1970, Ser. No. 92,058

Int. Cl. F15b *13/10*

U.S. Cl. 91—391 **10 Claims**

A hydraulic brake booster is disclosed which includes a spool valve slidably mounted within the booster housing to

control fluid communication between a source of hydraulic pressure and the booster pressure chamber. A secondary valve mechanism is slidably mounted on the end of the spool valve which closes when the vehicle operator effects a brake application and the spool valve fails to move. Closure of the secondary valve prevents a surge of hydraulic fluid from being communicated into the booster pressure chamber, should the spool valve move after a manual brake application has been initiated. A stop piston, which is slidably mounted in the



booster housing, engages the other end of the spool valve and cooperates with the secondary valve mechanism to prevent the latter from closing upon actuation of the spool valve if the fluid pressure level at the inlet of the booster is below a predetermined level. This feature permits hydraulic fluid to be communicated into the booster pressure chamber as soon as the vehicle's engine is started to assist the vehicle operator in applying the brakes of the vehicle.

3,677,141

DEVICE IN FLUID-CONTAINING CYLINDERS HAVING A FLUID-OPERATED PISTON

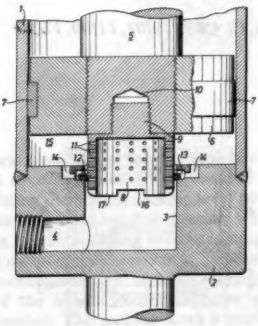
Roger Lagerqvist, and Stig Stenlund, both of Boras, Sweden, assignors to Monsun-Tison AB, Boras, Sweden

Filed Nov. 9, 1970, Ser. No. 87,910

Claims priority, application Sweden, Nov. 7, 1969, 15351/69

Int. Cl. F15b *15/22*

U.S. Cl. 91—394 **9 Claims**



A fluid-controlled buffer device in cylinders having a fluid-operated working piston, comprising a cylindrical buffer piston mounted at the end of the working piston and adapted to enter into a cylindrical fluid outlet bore in an end wall of the cylinder, an annular clearance between the cylindrical surfaces of said buffer piston and said bore being sealed by a sealing-ring mounted with radial play in an annular notch located in either of said cylindrical surfaces the other cylindrical surface being provided with passages which when the buffer piston is moved into said bore initially permit escape of the fluid from the cylinder but then are successively closed by the sealing-ring.

3,677,142

EXPANSIBLE CHAMBER DEVICE WITH INTERNAL ACCUMULATOR

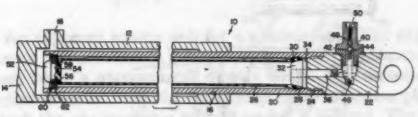
Wolfgang Roth, Oberauerbach, Germany, assignor to Deere and Company, Moline, Ill.

Filed Sept. 18, 1970, Ser. No. 73,375

Claims priority, application Germany, Oct. 30, 1969, P 19 54 604.4

Int. Cl. F01b *19/00*

U.S. Cl. 92—60 **5 Claims**



An extensible and retractable hydraulic motor having an internal accumulator comprising a cylinder, a piston reciprocally mounted within the cylinder, the piston being hollow and forming a chamber open to the interior of the cylinder, and an elastic container within the chamber filled with a compressible gas.

3,677,143

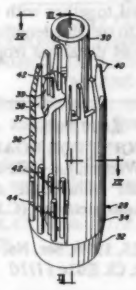
WELL SWAB

Charles D. Crickmer, 12923 Memorial Drive, Houston, Tex.

Filed June 26, 1970, Ser. No. 50,118

Int. Cl. F16j *1/04*

U.S. Cl. 92—241 **9 Claims**



A well swab and more particularly a well swab having an improved arrangement of reinforcing members therein including inner and outer concentric rows of circumferentially spaced reinforcing members with the reinforcing members of the inner and outer rows being spaced such that there is no overlapping therebetween and further that the reinforcing members have upper portions thereof which extend axially upwardly from the swab cup body member.

3,677,144

METHOD AND APPARATUS FOR MANUFACTURING FLAT, TUBULAR WRAPPERS

Earl A. Hudson, Glens Falls, N.Y., assignor to Reliance Paper & Bag Co., Long Island City, N.Y.

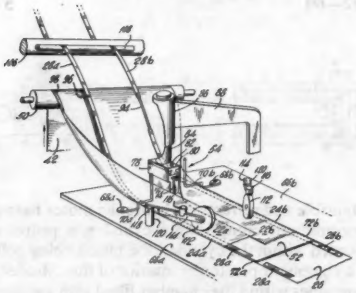
Filed May 24, 1971, Ser. No. 146,218

Int. Cl. B31d

U.S. Cl. 93—1 R **15 Claims**

A method and apparatus for folding an elongated web of foldable sheet material into a flat tubular wrapper for receiv-

ing packages of predetermined dimensions. Opposed longitudinal side areas of the web of sheet material are folded into overlapping relation around a pair of opposed edges of a folding plate while a feeding structure continuously feeds the web along the folding plate. Adhesive is applied by a suitable structure, in advance of the folding plate, to elongated narrow zones of the web. One of these zones becomes located between overlapping portions of the folded side areas to fasten them to each other. The other two zones are located respectively beside the fold lines one beside one fold line at the longitudinal central area of the web between the fold lines and the other beside the other fold line outside of the longitudinal



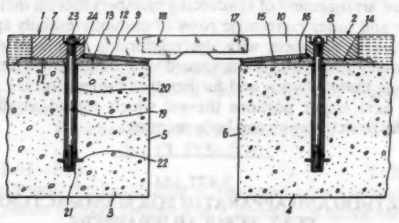
central area of the web. Stiffening strips are delivered to the inner surface of the web prior to folding thereof with these strips being respectively located beside the fold lines at the longitudinal central area between the fold lines. Thus, one of the strips adheres to the adhesive at the zone beside one fold line at the central area of the web while the other strip adheres to a folded side area when the latter is folded around a fold line to become located against the other stiffening strip. The thus folded sheet material together with the stiffening strips adhering thereto is cut into suitable lengths and score lines are provided at predetermined distances from the ends of each length.

3,677,145

EXPANSION JOINT FOR ROAD WORKS

Gerard Charles Lucien Wattiez, La Celle Saint Cloud, France, assignor to Compagnie Industrielle de Precontrainte et d'Equipment des Constructions (C.I.P.E.C.), Asnieres, France

Filed May 25, 1970, Ser. No. 40,199
Int. Cl. E01c *11/10*
U.S. Cl. 94—18 **9 Claims**



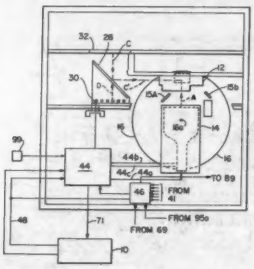
A concrete roadway having a joint between adjacent sections is provided with two plates, one secured upon each section, at the ends. The plates have interdigitating fingers to carry traffic over the joint. The plates are so tightly secured to the concrete by bolting that they remain in compression even when traffic is passing over the joint.

3,677,146

DATA SOURCE MICROFILM RECORDER WITH FORMS OVERLAY

Asger T. Nielsen, San Diego, Calif., assignor to Compufoto, Inc., Wellesley Hills, Mass.

Filed May 19, 1970, Ser. No. 38,718
Int. Cl. G03b *17/24*
U.S. Cl. 95—1.1 **20 Claims**



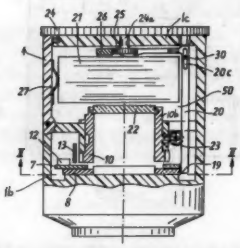
Microfilm apparatus in which a data-generated light display is combined with preprinted overlay information to produce superposed photographs. Featured are a logic system producing a sequential search through a stored series of transparencies with feedback ensuring proper selection of overlay transparency; mounting and positioning of the transparencies by means ensuring alignment; an axially centered disc form rotary transparency carrier together with a detent assembly precisely positioning the transparency and excluding transverse shift; and hard copy input systems sharing portions of the parts of the system, including the camera and in certain embodiments the light source, the screen mounting, the boresight or monitor and the beam combiner.

3,677,147

PHOTOGRAPHIC APPARATUS FOR MAKING EXPOSURES IN ACCORDANCE WITH THE CARRIER FREQUENCY METHOD

Rudolf Kremp, Gruenwald, and Alfred Winkler, Munich, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 21, 1970, Ser. No. 99,773
Claims priority, application Germany, Dec. 22, 1969, P 19 64 230.9
Int. Cl. G03b *19/02, 11/00, 17/36*
U.S. Cl. 95—1 R **19 Claims**

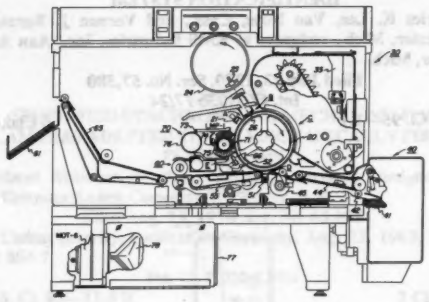


A photographic camera for repeatedly exposing a single film through a grating in accordance with the carrier frequency method has a release element which indexes the grating with reference to the film prior to opening of the shutter. The film is pressed against the grating while the shutter is open and the cassette for film has a shade which overlies the film before the cassette can be removed from the housing of the camera.

3,677,148
OPTICAL RECORDER

Philip L. Chen, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 28, 1970, Ser. No. 101,671
Int. Cl. G41b 17/10; G03g 15/00
U.S. Cl. 95—4.5 R 10 Claims

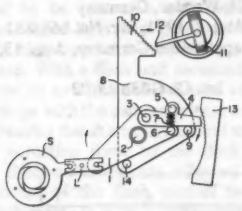


Non-impact printing or recording apparatus adapted for use with a digital computer. The apparatus is characterized by the employment of an optical character generator and timing system therefor capable of printing information on a moving photoresponsive medium.

3,677,149
INTERLOCKING DEVICE FOR THE EXPOSURE METER IN A CAMERA

Tatsuya Taguchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 23, 1970, Ser. No. 57,730
Claims priority, application Japan, July 28, 1969, 44/71497
Int. Cl. G03b 9/02
U.S. Cl. 95—10 C 3 Claims

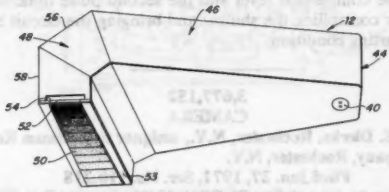


An interlocking device for the exposure meter in a camera includes a rotatable interlocking member engaging an exposure regulating member, a locking lever pivotally mounted on the interlocking member for rotation with the interlocking member, a needle scanning member engageable with the interlocking member and movable in response to the rotation of the interlocking member and the locking lever to scan the position of the needle of the exposure meter, and a fixed locking member. The locking lever is moved with respect to the interlocking member by the movement of the latter when the scanning member is stopped, and that movement of the locking lever is imparted to the fixed locking member without exerting any great force upon the needle of the photoexposure meter. Another embodiment further provides means to make the movement substantially linear of the lever which is moved by the exposure control interlocking pin provided at the lens. Moreover, means are provided for reducing the gap between the needle of the exposure meter and the stepped portion of the interlocking lever before exposure adjustment.

3,677,150
SENSITOMETER LIGHT SOURCE APPARATUS

Lloyd Clifford Sanford, Acton, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Oct. 2, 1970, Ser. No. 77,466
Int. Cl. G01j 1/52
U.S. Cl. 95—10 R 19 Claims

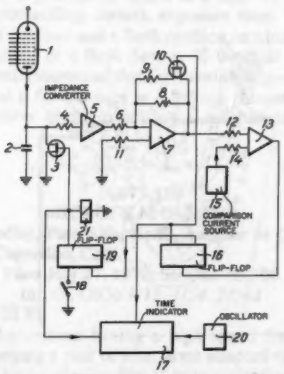


An exposure source unit for a sensitometer. The exposure source unit provides in a single structure the combination of a flash lamp, a photographic density wedge, and a plurality of radiation paths from the flash lamp to an exposure plane in which the photographic density wedge is located. The exposure source unit is constructed to provide substantially uniform radiation over the entire area of the exposure plane. In first and second embodiments, a flash lamp is located adjacent to one end of the exposure source unit, and the exposure source unit presents a plurality of folded optical paths to the exposure plane. The folded optical paths prevent radiation from directly striking the exposure plane. The cross sectional area of the exposure source unit increases as the distance from the flash lamp increases. The internal walls of the unit are formed of highly reflective, light scattering surfaces so that light is thoroughly scattered before reaching the exposure plane. In a third embodiment, the exposure source unit is constructed of clear plastic and is shaped so radiation from the lamp is selectively internally reflected within the unit and selectively transmitted from the unit to provide substantially uniform radiation over the entire area of the exposure plane.

3,677,151
ELECTRONIC EXPOSURE TIME MEASURING CIRCUIT WITH TIME INDICATOR AND SHUTTER CONTROL MEANS

Nickel Werner, Sinn, Germany, and Christopoulos Nikolaos, Piraus, Greece, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed Jan. 11, 1971, Ser. No. 105,574
Claims priority, application Germany, Feb. 11, 1970, P 20 06 025.07
Int. Cl. G03b 17/18, 9/62, 7/08
U.S. Cl. 95—10 CE 4 Claims



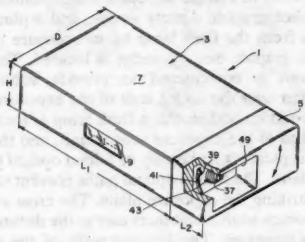
A combined electronic exposure time measuring device with time indicator and shutter control means. The shutter

control means is operated in dependence on the voltage level of a capacitor, and electronic means are provided for amplifying the capacitor voltage immediately at the beginning of the measurement during a fraction of the exposure time to be expected. The voltage thus reaches quickly a comparison level and the pulse obtained thereby is used for stopping the indicating device and also for switching the amplification to a ratio of 1:1. Thereafter, the voltage level approaches slowly again the comparison level and the second pulse obtained is used for controlling the shutter and bringing the circuit back to its starting condition.

3,677,152
CAMERA

James E. Dierks, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 27, 1971, Ser. No. 110,218
Int. Cl. G03b *19/02*
U.S. Cl. 95—11 R 7 Claims

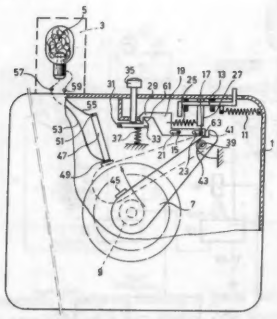


A camera including a generally prismatic body which includes a pair of relatively rotatable sections. One section houses a mechanism for transporting film strip past an exposure station at which frames of film are sequentially exposed, and the other section is coupled to the transport mechanism and is rotatable for successively actuating the mechanism to effect the incremental advancement of the film. The provision of the actuating means changes no camera dimension other than slightly increasing the length of the camera.

3,677,153
CAMERA WITH PIEZOELECTRIC CRYSTAL FLASH IGNITION SYSTEM

Johannes Gerardus Bok, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 24, 1969, Ser. No. 860,582
Claims priority, application Netherlands, Sept. 27, 1968, 6813923
Int. Cl. G03b *19/02*
U.S. Cl. 95—11 R 1 Claim

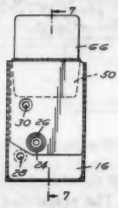


A camera comprising percussive means on the shutter blade for striking a piezoelectric crystal device and thereby producing an electric voltage for igniting flashlamps when the aperture of the lens is exposed by the shutter blade. The energy required for exposing the lens aperture and striking the crystal is provided by a spring that is tensioned by the film transport mechanism.

3,677,154
CARD AND HOLDER FOR FINGERPRINT IDENTIFICATION SYSTEM

Charles K. Lee, Van Nuys, Calif., and Vernon J. Burzan, Dexter, Mich., assignors to KMS Industries, Inc., Ann Arbor, Mich.

Filed July 23, 1970, Ser. No. 57,580
Int. Cl. G03b *17/24*
U.S. Cl. 95—1.1 6 Claims

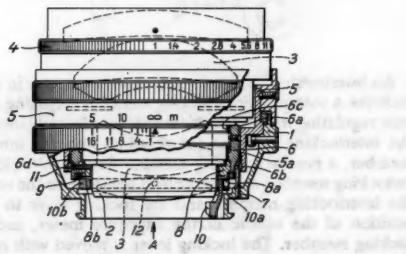


An identification card and holder for personal identification in the form of an apertured sheet of material carrying a holographic transparency at a perforation for holding data such as a finger print, and a holder for said card in the form of an envelope with apertures to register with the transparency and a light mask slidable in the envelope from a position covering the transparency to a position to expose the transparency to a light source, the envelope and mask cooperating to position the mask in a covering position or an exposed position.

3,677,155
LENS MOUNT

Gerhart Bechmann, Midland, Ontario, Canada, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed Aug. 2, 1971, Ser. No. 168,032
Claims priority, application Germany, Aug. 13, 1970, P 20 40 227.1
Int. Cl. G03b *13/02*
U.S. Cl. 95—44 C 4 Claims



For setting a photographic objective to a specific object distance, the objective is provided with an inner lens barrel (2) wherein a plurality of lenses are mounted, and with an outer range adjustment ring (5). The lens barrel moves back and forward in axial direction upon rotation of the adjustment ring (8). A cam ring having its cam extending in axial backward direction is coaxially mounted around the lens barrel for joint back and forward movement. Mechanical means

(6) interconnect the cam ring with the range adjustment ring so that the cam ring is both displaced axially and also rotated when the objective is set to a specific distance. A cam follower is tiltably provided in the lens mount having one arm projecting in the direction of the camera body. The arm moves back and forward during range adjustment as a function of the difference between the lens barrel displacement and the cam gradient and transmits information to the range finder in the camera body.

3,677,156

SIMPLIFIED SYNCHRONIZING MECHANISM FOR CAMERAS ADAPTED TO USE MECHANICALLY FIRED FLASH LAMPS

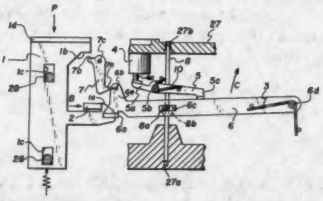
Helmut Ettischer, Stuttgart-Wangen, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1970, Ser. No. 65,035

Claims priority, application Germany, Aug. 23, 1969, P 19 43 054.7

Int. Cl. G03b *15/04*

U.S. Cl. 95—11.5 R **2 Claims**



A photographic camera is provided with a simplified flash synchronizing mechanism utilizing a flash control lever which is positioned to be operative only when a flash unit is mounted. For natural light photography, shutter driver release is controlled solely by a latch arm which is an element of the camera release. With a flash unit mounted, the flash control lever is moved to an operative position where it is actuated through a linkage with the camera release and serves both as a final latch releasing the shutter driver and as a connecting link transmitting actuating force to the flash unit. Since both shutter and flash actuation are effected through a single operative motion of the flash control lever, synchronized operation is achieved.

3,677,157

CONTROL, SIGNAL AND ACTUATING MECHANISM FOR USE WITH PHOTOFLASH LAMP UNITS HAVING PRE-ENERGIZED STRIKERS

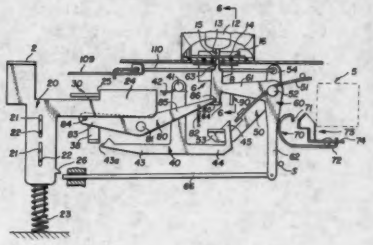
Edward L. Sturm, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 14, 1968, Ser. No. 767,145

Int. Cl. G03b *15/04*

U.S. Cl. 95—11.5 R **13 Claims**

A sensing probe movable into contact with a pre-energized striker element of a percussion-ignitable photoflash lamp in response to partial actuation of the shutter release of a camera. In response to the sensing probe, a signal is presented in the camera view finder and/or the shutter release lever is locked to prevent picture-taking. A control is provided to prevent operation of the sensing member when a flash unit is not mounted in the camera. The striking element is released



by first non-releasingly engaging the striker with an actuating member, then striking the member to effect release.

3,677,158

MECHANISM FOR SYNCHRONIZING OPERATION OF A CAMERA SHUTTER AND A MECHANICALLY ACTUATED FLASH DEVICE

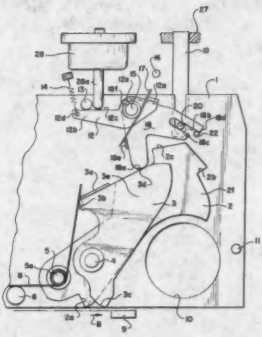
Wolfgang Ort, Stuttgart-Bad Cannstatt, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 29, 1970, Ser. No. 86,528

Claims priority, application Germany, Nov. 3, 1969, P 19 55 080.2; Nov. 3, 1969, G 69 42 571.4

Int. Cl. G03b *9/70*

U.S. Cl. 95—11.5 **3 Claims**



A member is positioned to act as a stop on shutter blade travel thus controlling camera exposure time. The member has a normal position and a flash position to which it is moved by the mounting of a flash device. In the flash position the member permits increased shutter travel thus increasing exposure time and it further acts as a linkage transmitting energy from the shutter blade to actuate a mechanically operable flash device.

3,677,159

MICROFILM CAMERA

David K. Studley, Palo Alto, Calif., assignor to Quantor Corporation, Cupertino, Calif.

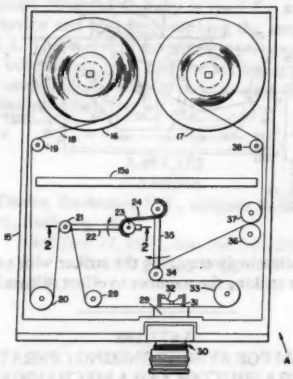
Filed July 27, 1970, Ser. No. 58,380

Int. Cl. G03b *1/18, 1/54, 21/43*

U.S. Cl. 95—31 EL **12 Claims**

A microfilm camera having a high speed frame advance system comprising a pair of idler arms adapted to control the supply and take-up of microfilm so as to maintain substantially constant tension thereon. An aperture at which the microfilm is photographically exposed and a frame advance drive roller

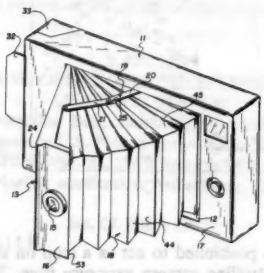
are disposed between the idler arms. The frame advance drive roller is rotatably driven, on demand, by a servomotor which is energized by a digital control circuit. The digital control circuit receives feedback information from a shaft encoder connected to the servomotor and functions to accelerate and decelerate the servomotor in response thereto.



3,677,160
COMPACT FILM-PACK CAMERA

Donald M. Harvey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 2, 1970, Ser. No. 94,360
Int. Cl. G03b *17/04*
U.S. Cl. 95—40 4 Claims

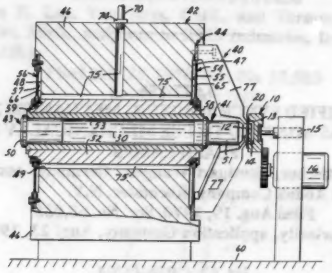


A self-processing film-pack camera is provided with a cover door having one end hinged to a boxlike camera housing and an opposite end for supporting an objective of the camera. A three-sided light-tight bellows is coupled between the housing and door in a manner permitting movement of the latter between a closed position, wherein the door is substantially parallel to one wall of the housing, and an open position, wherein the door extends outwardly from the housing at an oblique angle. When the door is closed, the bellows is collapsed with its three sides located within the housing laterally adjacent corresponding sides of the housing. Exposed film units are removed from the housing through an opening in a fourth side aligned with an opening in the camera housing. This construction allows the thickness of the closed camera to be reduced in comparison to similar previously known cameras in which a collapsed bellows is located between the film pack and the camera door.

3,677,161
HIGH REDUCTION CAMERA AND LOCATING APPARATUS

Derrick A. Jones, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 16, 1970, Ser. No. 11,367
Int. Cl. G03b *3/10*
U.S. Cl. 95—45 2 Claims

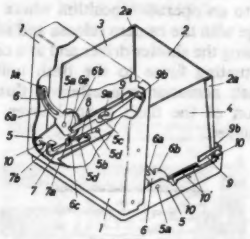


Locating apparatus, utilized in combination with a high reduction imaging system including a photographic film holder, an image projector and wherein the locating apparatus includes two circular diaphragms for supporting a lens holder, and pressurized fluid means acting on the diaphragms to produce a differential force to deflect the diaphragms and precisely position the lens holder relative to a test sample of photographic film.

3,677,162
HOOD FOR A FOCUSING SCREEN OF A CAMERA

Junichi Yokozato, Tokyo, Japan, assignor to Zenza Bronica Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1970, Ser. No. 93,955
Claims priority, application Japan, Dec. 8, 1969, 44/116580
Int. Cl. G03b *11/04*
U.S. Cl. 95—47 4 Claims



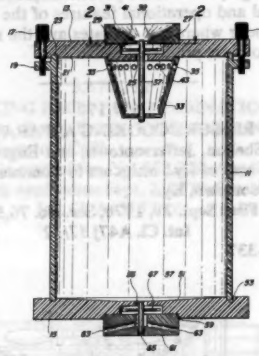
A focusing or light-hood for a focusing screen of a photographic camera, the hood having three hinged plates and a hinged front covering plate, forming a square hood, in which the front covering plate can be folded over the focusing screen, the hood having a structure wherein the uppermost front covering plate is pressed to be turned backward for being folded, the turning movement of which is transmitted to the other three covering plates pivotally mounted on two sides and the back of the screen, the closure of the hood being caused by pressing the front covering plate; the hood which is thus collapsed can be errected with one touch of the front covering plate.

3,677,163

METHOD AND APPARATUS FOR PROCESSING PHOTOGRAPHIC FILM

Roy Donald Porter, Victoria, Australia, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 10, 1965, Ser. No. 454,543
Int. Cl. G03d 1/14
U.S. Cl. 95—90.5 6 Claims



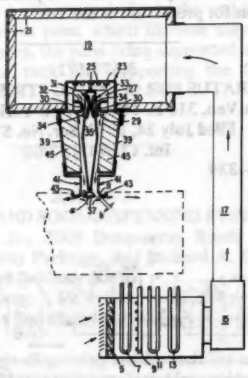
A light-tight tubular processor housing adapted to receive a sheet of photographic material therein and having a liquid admitting opening at one end, a liquid discharge opening at the other end and a reservoir within the housing which communicates with the liquid admitting opening and with the interior of the housing. The reservoir receives a processing liquid and stores the same out of contact with the interior of the housing in a first orientation and subsequently discharges the liquid into the housing upon movement of the latter to a second orientation.

3,677,164

CEILING AIR TERMINAL

Darwin G. Traver, De Witt, and Carl C. Herb, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 29, 1968, Ser. No. 779,834
Int. Cl. F24f 13/08
U.S. Cl. 98—40 D 1 Claim



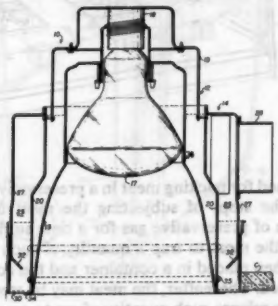
A ceiling air terminal employing inflatable bladders for regulating the volume of conditioned air discharged therefrom into the area being conditioned.

3,677,165

ADJUSTABLE AIR PATTERN AIR DIFFUSER

James C. Gibbs, and Harry Daninhersch, both of Danbury, Conn., assignors to Connor Engineering Corporation, Danbury, Conn.

Filed Oct. 23, 1970, Ser. No. 83,436
Int. Cl. F24f 13/06
U.S. Cl. 98—40 DL 5 Claims



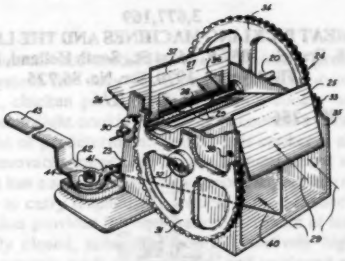
An air diffuser providing a selectively adjustable air distribution pattern for use in combination with lighting fixtures or the like. An air distributing plenum is formed by an inner wall surrounding the lighting fixture, or the like and an outer wall spaced from the inner wall and defining an air flow channel between said walls leading to an outlet adjacent the open end of the lighting fixture. The pattern of discharge of air from the channel outlet is selectively controlled by means of an elastic deflector band surrounding and elastically gripping the inner wall, said band extending into the air path in the channel and subject to selective positioning with respect to the channel outlet to deflect the air discharge from the outlet.

3,677,166

ADJUSTABLE SPEED AIR DRIVE-AIR SWEEP FOR AIR CONDITIONER

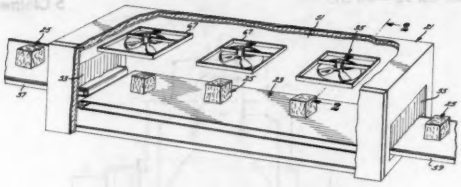
George William Sisk, Jr.; Arthur William Miller, and Frank Koleszar, all of Evansville, Ind., assignors to Whirlpool Corporation

Filed April 30, 1970, Ser. No. 33,403
Int. Cl. E06b 7/084
U.S. Cl. 98—94 13 Claims



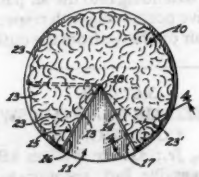
A variable directing apparatus for a fluid stream that may be used, for example, to direct air emerging from a room air conditioner. The apparatus includes movable directing means for changing the direction of the fluid stream and a fluid propelled rotatable device in a portion of the fluid stream for moving the directing means. The apparatus also has an adjustable fluid blocking device for blocking the stream to the rotatable device to a desired degree so as to regulate the speed of rotation of the rotatable means and thus the speed of movement of the movable fluid directing device.

3,677,167
APPARATUS FOR PRESERVATION OF MEAT
Dennis Richard Berg, 10216 Vultee #2, Downey, Calif.
Filed Jan. 7, 1970, Ser. No. 1,263
Int. Cl. A47j *47/02*
U.S. Cl. 99—234 6 Claims



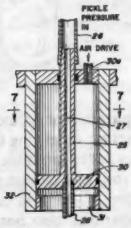
A method for packing meat in a preservative atmosphere including the steps of subjecting the meat to a freezing atmosphere of preservative gas for a time sufficient to freeze a crust on the meat to trap a quantity of such gas therein. The meat is then placed in a container and the container hermetically sealed. Thereafter, the meat may be stored and the crust thawed to release such quantity of gas to create a preservative atmosphere within the container.

3,677,168
PIE AND CAKE SAVER
R. Gordon Bell, 6815 N. 58th Place, Scottsdale, Ariz.
Filed June 4, 1971, Ser. No. 150,032
Int. Cl. A47j *43/00*
U.S. Cl. 99—234 S 5 Claims



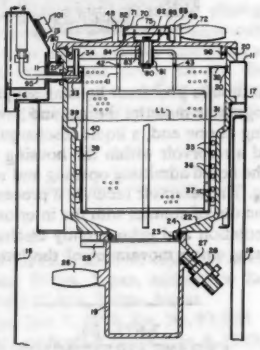
A culinary device for shielding the cut surfaces of cakes, pies and the like comprising one continuous piece forming two flat plates pivotally attached by an integrated hinge structure.

3,677,169
MEAT PICKLING MACHINES AND THE LIKE
Joseph S. Francis, 1057 E. 161st St., South Holland, Ill.
Filed Nov. 4, 1970, Ser. No. 86,725
Int. Cl. A23b *1/16*
U.S. Cl. 99—256 2 Claims



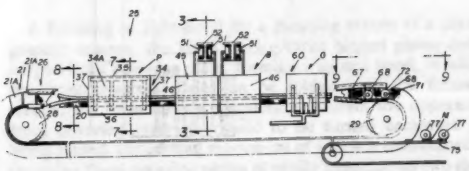
A meat pickling machine of the type wherein the meat body is advanced either continuously or intermittently past a pickling stage where a pickling needle is driven up and down to pierce the body being pickled, such needle being provided with a longitudinally extending pickling liquid supply passage terminating in a tapered and pointed lower end, such passage being connected to a source of pickling fluid which is delivered out from such longitudinal needle passage through one or more lateral openings of the needle during the interval of pierce of the meat body by such needle, provision being made for return of the needle to its non-piercing position after each piercing and liquid delivering operation preparatory to the succeeding operation, the present improvements concerning structural and operational features of the piercing needle and the cylinder wherein it operates and the manner wherein such operations are produced.

3,677,170
PRESSURE COOKING APPARATUS
Winston L. Shelton, Jeffersontown, and Eugene A. Pottinger, Louisville, both of Ky., assignors to Commercial Appliances, Inc., Jeffersontown, Ky.
Filed Sept. 29, 1970, Ser. No. 76,557
Int. Cl. A47j *37/12*
U.S. Cl. 99—337 7 Claims



An apparatus for cooking food under pressure in a basket while immersed in a batch of cooling liquid includes a separable unit for collecting particles of food dropping from the basket, and for enhancing the useful life of the liquid and the edibility of the food. The cooking vessel is controllably heated and the apparatus is provided with a plurality of pressure relieving means for protection of the user.

3,677,171
APPARATUS FOR COOKING STRIPS OF MEAT
Wayne P. Le Van, 310 E. 44th St., New York, N.Y.
Filed July 24, 1970, Ser. No. 57,904
Int. Cl. A47j *37/00*
U.S. Cl. 99—339 23 Claims



This disclosure is directed to a method and apparatus for cooking or broiling strips of bacon or the like by conveying a plurality of strips of bacon between a pair of complementary

heat pervious belts arranged to travel in unison so that the relative linear speed therebetween is maintained substantially zero. The strips so conveyed are first advanced through a steam oven or bath wherein the strips are preheated to a predetermined temperature. The preheated strips are then conveyed through a broiling oven. Subsequent to the broiling operation the cooked strips are passed through a vacuum chamber in which the liquified fat or grease is removed by evacuation. The bacon strips are then subsequently blotted on each side to further remove the grease or fat adhering thereto prior to the packaging operation.

3,677,172

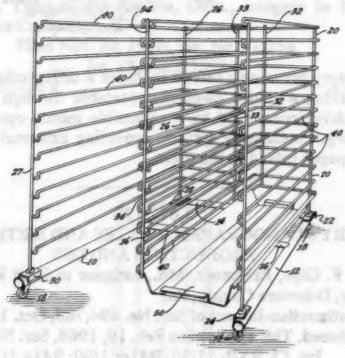
COOKING RACK-PAN COMBINATION

James D. Wilson, Long Beach, Calif., assignor to Banner Metals, Inc., Compton, Calif.

Continuation-in-part of Ser. No. 853,380, Aug. 27, 1969, abandoned. This application Sept. 2, 1970, Ser. No. 68,850

Int. Cl. A47j *37/10*

U.S. Cl. 99—347 **4 Claims**



An improved rack-pan combination is provided which has particular utility in the industrial cooking of food, such as fish. The combination of the invention includes an improved rack which may be nested with other similar racks, and it includes a plurality of impervious pans, which likewise may be nested with other similar pans, the pans being supported in a stacked relationship on the rack and supporting the food being cooked.

3,677,173

STEAMER AND SODA-DISPENSING SYSTEM

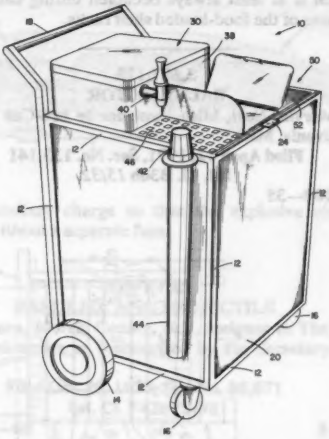
William A. Fogle, Jr., 3008 Dunmurray Road; Joseph B. Jason, 3018 Liberty Parkway, and Richard A. Head, 2239 Searles Road, all of Baltimore, Md.

Filed Aug. 3, 1970, Ser. No. 60,327

Int. Cl. A47j *39/02*

U.S. Cl. 99—357 **10 Claims**

A steamer and soda-dispensing system includes an enclosed housing having removable side panels and is provided with rollers for portability. A handle is mounted on an upper portion of the housing to facilitate manual control and movement of the housing. Pressurized, soda containers are positioned inside the housing and feed soda through a cooling unit to a manually operated dispensing faucet. A burner and an associated fuel tank are located inside of the housing and facilitate the heating of a steaming unit for cooking hot dogs and the like. A cup



dispenser and facilities for supporting mustard and catchup containers are included with the housing.

3,677,174

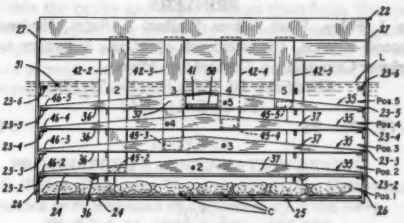
DEEP FAT FRYING EQUIPMENT AND METHOD OF USE

Arthur F. Pelster, and Donald D. Modglin, both of Nashville, Tenn., assignors to Kentucky Fried Chicken Corporation

Filed Dec. 10, 1970, Ser. No. 96,790

Int. Cl. A47j *37/12*

U.S. Cl. 99—417 **8 Claims**



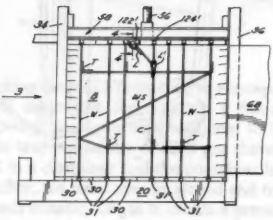
Equipment for and method of use of a closed, pressurized cooking system for deep fat frying of moisture-containing foods, e.g., chicken parts, which includes a cooker having a closable steam-tight cooking chamber to contain a pool of hot liquefied fat of predetermined depth. This cooker is adapted to have removably immersed therein a plural-tiered support rack which has a series of vertically spaced supporting devices removably to carry respectively a stack of food-loaded racks. The invention provides in combination therewith at least one substantially closed, substitute tank of relatively high heat transfer character, such as aluminum, and equipped with an upwardly extending, filler standpipe having an open top end to extend above the level of the surface of the pool, for delivery into the tank chamber of a quantity of water and for venting therefrom steam to which the water is converted during the cooking procedure. The weight of the standpipe-equipped tank and its contained water approximates the weight of a normally food-loaded shelf rack for which it is substituted with the rate of venting of the steam approximating that from the food carried by this shelf rack should the latter be supported in the stack rather than the substitute water-containing tank.

A group of such water-containing substitute tanks are provided to occupy the positions in the plural-tiered support rack of the stack of food-loaded shelf racks except the bottom position which is at least always occupied during each cooking cycle by one of the food-loaded shelf racks.

3,677,175
BALE EJECTOR

Neil T. Marvin, Novi, Mich., assignor to Bra-Can Industries, Inc., Livonia, Mich.

Filed April 12, 1971, Ser. No. 133,141
Int. Cl. B30b *15/32*
U.S. Cl. 100—35 10 Claims

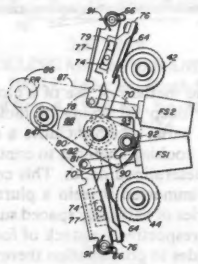


The removal of bales from a baler having a vertically reciprocable press platen and a side opening baling chamber door is effected by passing a lifting cable around the bale while in the chamber and connecting the cable to a bale lifting arm projecting laterally from the compacting platen over and beyond the chamber door opening such that upon raising the platen the bale is swung outwardly from the chamber and upon descent of the platen the bale may be rested on a support outside the chamber.

3,677,176
RIBBON CONTROL APPARATUS FOR HIGH SPEED PRINTERS

John J. Foley, West Acton; Wallace J. Satas, Hudson, and Joseph Konkel, Lynnfield, all of Mass., assignors to Data Printer Corporation, Cambridge, Mass.

Filed Sept. 10, 1970, Ser. No. 71,154
Int. Cl. B41j *34/14*
U.S. Cl. 101—96 5 Claims

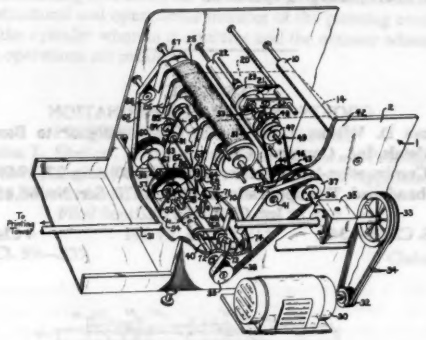


Ribbon control apparatus for a high speed printer in which the ribbon is intermittently and reversibly driven between a pair of reels while being steered from side to side to prevent a net uneven takeup on one reel or the other. The ribbon drive is synchronized with the type carrier and enabled by a print signal produced while printing is in progress. Counting means stepped by the counter when the print signal is absent delays disengagement of the ribbon drive to ensure movement of the ribbon at least one each print cycle.

3,677,177
DRIVE FOR CONTROLLING WEB LENGTH IN ROTARY PRINTING PRESSES

Roy R. Smith, Jr., Leawood, Kans., assignor to Smith R.P.M. Corporation, Kansas City, Mo.

Filed July 28, 1970, Ser. No. 58,809
Int. Cl. B41f *13/02*
U.S. Cl. 101—228 1 Claim



A rotary press web infeed includes a differential transmission having a spider assembly rotatable through a variable speed drive controlled by a reversible motor operated by a web length measuring system, providing extremely fine control of paper infeed to the press.

3,677,178
DRY PLANOGRAPHIC PLATES AND METHODS, PRODUCTION AND USE

Harry F. Gipe, Baltimore, Md., assignor to Scott Paper Company, Delaware County, Pa.

Continuation-in-part of Ser. No. 494,768, Oct. 11, 1965, abandoned. This application Feb. 19, 1968, Ser. No. 706,286
Int. Cl. B32b *25/20;* B41m *1/00;* B41n *1/12*
U.S. Cl. 101—450 9 Claims

A new "dry planographic" plate comprised of a flexible substrate having coated thereon a cured solid but elastic silicone rubber film which will not remove conventional lithographic ink from an ink roller on a printing press, a method of producing this plate and a new "dry planographic" process wherein the new planographic plate of the present invention is not wet with a fountain solution.

3,677,179
TELESCOPING ORDNANCE DEVICE

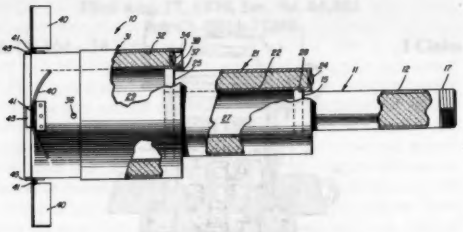
Lester A. Potteiger, Fredericksburgh, Va., and The United States of America as represented by the Secretary of the Navy

Filed Sept. 29, 1966, Ser. No. 583,498
Int. Cl. F42b *13/32*
U.S. Cl. 102—56 12 Claims

1. An ordnance device adapted for flight through the air comprising:

a plurality of individual warheads in telescoped relation;

means for extending the length of the ordnance device from a collapsed position for storage to an extended position in flight; and



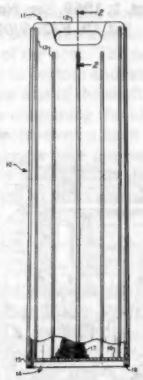
stop means on each of said warheads for preventing separation of adjacent warheads when said device is in its extended position.

3,677,180

EXPLOSIVE DEVICE AND CONTAINER

William E. Thomas, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Nov. 20, 1970, Ser. No. 91,274
Int. Cl. F42b *3/00*
U.S. Cl. 102—24 R 5 Claims



An explosive device is formed by an elongated, tapered tube closed at the smaller diameter end. A carrying handle is formed on the closed end. The interior of the tube is filled with an explosive material, such as a mixture of ammonium nitrate and a liquid hydrocarbon. A cap is sealed across the larger diameter end of the tube.

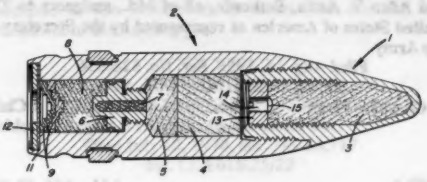
3,677,181

PROJECTILE WITH MULTIPLE EFFECT

Gunnar Giljarhus, and Hans Vien, both of Raufoss, Norway, assignors to A/S Raufoss Ammunisjonsfabrikker, Raufoss, Norway

Filed Oct. 15, 1969, Ser. No. 866,662
Int. Cl. F42b *13/04*
U.S. Cl. 102—52 4 Claims

A multiple effect projectile having two incendiary charges connected by a bore and an explosive charge behind the



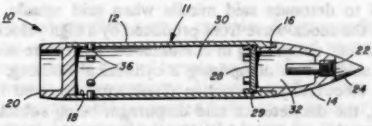
second incendiary charge so that the explosive charge is detonated without a separate fuse.

3,677,182

BASE EJECTING PROJECTILE

Ralph Peterson, Morris County, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Oct. 29, 1970, Ser. No. 85,071
Int. Cl. F42b *13/46*
U.S. Cl. 102—66 5 Claims



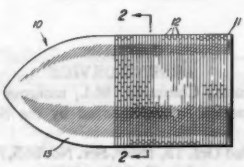
A base ejecting projectile includes a casing defining a cavity, fuse means closing the cavity at one end and an end cap closing the cavity at the other end. Actuation of an ignition device and an expelling charge generates pressurized gas within the cavity, which pressurized gas causes a piston to slide within the cavity and expel a cargo therefrom. Escape of the pressurized gas from the cavity with an attendant signature noise is precluded by sealing means which prevent the rapid escape of pressurized gas from the cavity concurrently with or subsequent to cargo expulsion.

3,677,183

PRE-SHAPED FRAGMENTATION DEVICE

James C. Talley, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 31, 1966, Ser. No. 591,005
Int. Cl. F42b *13/48*
U.S. Cl. 102—67 7 Claims

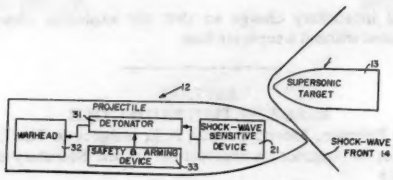


There is disclosed a cylindrically-shaped fragmentation device consisting of a plurality of preformed shims or wafers arranged in brick-like fashion to form an explosive casing. The shims project edge-on when the munition is detonated but due to their unique shape they assume a dynamically stabilized flight path.

3,677,184
PROXIMITY FUZES

Jacob Rabinow, Takoma Park; Israel Rotkin, Silver Spring, and Allen V. Astin, Bethesda, all of Md., assignors to The United States of America as represented by the Secretary of the Army

Filed Aug. 16, 1955, Ser. No. 528,856
Int. Cl. F42c 11/02, 13/06, 5/00
U.S. Cl. 102—70.2 P 1 Claim



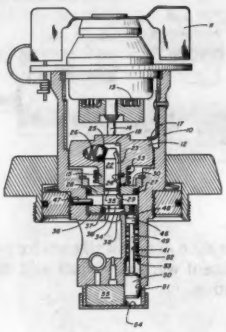
1. In an ordnance missile, a proximity-type ordnance fuze adapted to detonate said missile when said missile passes through the shock-wave front produced by a high velocity target, said fuze comprising in combination: a pressure-sensitive switch; said switch comprising a cylindrical housing, a perforated electrically conductive diaphragm mounted in said housing, the diameter of said diaphragm being substantially normal to the axis of said missile and the longitudinal axis of said cylindrical housing, one end of said housing being internally threaded an externally threaded ring adapted to mate with the threaded end of said housing and movable therein in a direction parallel to said axis of said missile, said ring and diaphragm being positioned such that movement of said ring in said direction causes said ring to press against said diaphragm thereby increasing the tension of said diaphragm, an electrical contact fixed in said housing substantially perpendicular to the diameter of said diaphragm, said contact extending adjacent to and spaced from said diaphragm, said contact being insulated from said housing, said diaphragm being sufficiently flexible so that said diaphragm can contact said contact as a result of abrupt changes in pressure encountered when said missile passes through said shock-wave front; detonation means adapted to detonate said missile in response to the application of a firing signal thereto; and an energy source connected in series with said detonation means and said switch, the contacting of said diaphragm and contact causing a firing signal to be applied by said energy source to said detonation means thereby causing detonation of said missile.

3,677,185
ARMING DEVICE

William H. Reams, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 13, 1969, Ser. No. 865,707
Int. Cl. F42c 15/24
U.S. Cl. 102—78 4 Claims

An arming device which requires both air vane rotation of a predetermined duration and target impact in sequence to complete arming. Movement of an arming rotor from an unarmed to an armed position is blocked by a plunger biased from the arming rotor path of movement but prevented from responding to the biasing action by a rotary element in the path of the plunger. The rotary element is freed for movement by the plunger only upon sensing of the sequential occurrence

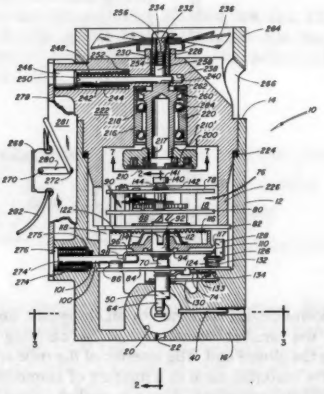


of the air vane rotation of predetermined duration and target impact.

3,677,186
VELOCITY DISCRIMINATING TIME MECHANICAL ORDNANCE FUZE

Arnold S. Munach, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 1, 1969, Ser. No. 862,700
Int. Cl. F42c 9/02
U.S. Cl. 102—83 20 Claims



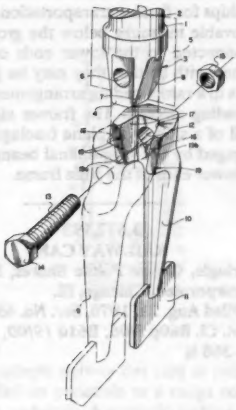
A mechanical ordnance fuze having an arming slider held by a timer controlled lock and a catch rod. Axially aligned with the catch rod are a pair of centrifugally opened detents attached to a shaft rotated by a wind driven vane. When the vane is rotating sufficiently fast to open the detents, the catch rod, released by the timer, passes between the detents and clears the arming slider, thereby allowing the slider to arm when released by the lock. Otherwise the catch rod is blocked by the unopened detents and when the timer operates to unlock the slider, it is caught by the catch rod and the fuze remains unarmed.

3,677,187

REVERSIBLE TAMPING BAR

John Kenneth Stewart, Columbia, S.C., assignor to Tamper Inc., West Columbia, S.C.

Filed Aug. 17, 1970, Ser. No. 64,351
Int. Cl. E01b 27/00
U.S. Cl. 104—10 1 Claim



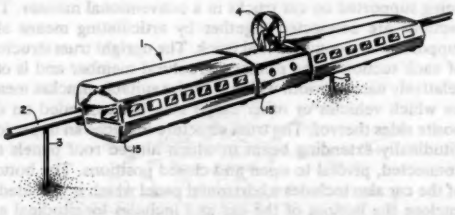
Railway ballast tamping mechanism has an oscillatable shaft terminating at its lower end in a nose which has a lateral bore. A pair of tamping tool supports have similar lateral bores adapted to be aligned with the nose bore to receive the shank of the bolt of a nut and bolt combination for securing the supports one on each side of the nose. The nose has faces inclined inwardly both from top to bottom and laterally from a vertical plane which contains the axis of the shaft and is perpendicular to the horizontal plane containing the axes of the bores. The nose has four of such faces, two on each side of and adjoining said plane, and the supports have opposed pairs of faces correspondingly inclined to mate with the nose faces so that any tendency of the supports to move upward places the bolt in tension.

3,677,188

STABILIZING MONORAIL VEHICLE

Marcel E. Bordes, P. O. Box 26124, New Orleans, La.

Filed May 12, 1969, Ser. No. 823,580
Int. Cl. B61b 13/06; B61c 13/08; B61d 17/02
U.S. Cl. 104—120 20 Claims



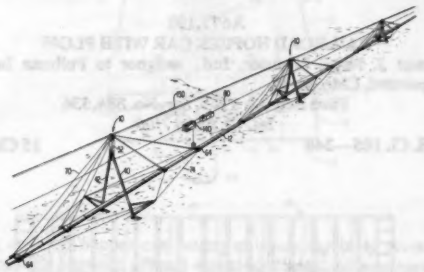
A vehicle for a monorail system wherein the vehicle straddles and freely turns about the rail either directly in the case of a cylindrical monorail or by means of specially designed running gear wherein the cab proper then turns about the running gear; the center of gravity of the vehicle is located below the axis of as oscillation of or turn center and the sides are symmetrically and conversely formed in order to divert side winds both above and below the vehicle for negating the effects of side winds; the vehicle can be easily removed from the rail; the seats and baggage platforms or other weights are moved laterally to balance the vehicle and emergency braking system is provided, which includes a friction member on the underside of the vehicle which mates with the rail upon withdrawal of the running gear.

3,677,189

AERIAL PIPELINE SYSTEM

Weldon F. Appelt, 2102 Quenby, Houston, Tex.

Filed July 10, 1970, Ser. No. 53,717
Int. Cl. E01b 25/22
U.S. Cl. 104—124 6 Claims



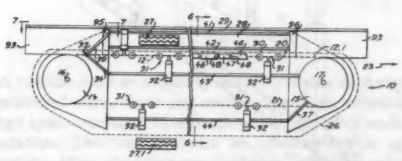
The aerial pipeline system provides for suspending large diameter pipe between a plurality of spaced towers across every conceivable type of terrain and in all climates. Each of the towers is of approximate A-frame configuration with an aerial tramway cable suspended between each tower through the opening between the legs of the tower for the purpose of transporting the pipe and other supplies during construction of the pipeline and for transporting inspection and maintenance personnel and supplies subsequent to construction. The pipeline will be suspended from the towers and extend through the opening between the legs. Depending upon the loading, the pipeline may be arranged for either vertical or horizontal expansion and contraction. A multiple section, hinged trolley beam is also disclosed for supporting and transporting long sections of pipe along the cable which is suspended in a sagging manner between adjacent towers. A smaller manually portable cable tramway is also provided for bringing in supplies for the construction of the pipeline.

3,677,190

SURFACE AUTOMOBILE CONVEYOR

Charles Peter Koch, Vancouver, British Columbia, Canada, assignor to Monarch Western Equipment Ltd., Vancouver, British Columbia, Canada

Filed Oct. 22, 1970, Ser. No. 82,876
Int. Cl. B65g 17/24
U.S. Cl. 104—172 B 9 Claims



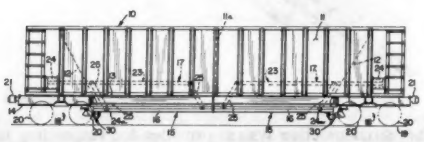
An automobile conveyor which has a plurality of automobile pushing units having pushing rollers spaced at intervals along an endless chain which travels over sprockets mounted for rotation about vertical axes. The rollers are swingable in a plane transversely to the chain. Means is provided for selec-

tively swinging any of the rollers on an advance run of the chain into a pushing position behind a tire of a wheel of an automobile so as to move the automobile and means is provided for enabling a roller pushing an automobile to swing away from the tire after the automobile has been moved a required distance.

ERRATUM

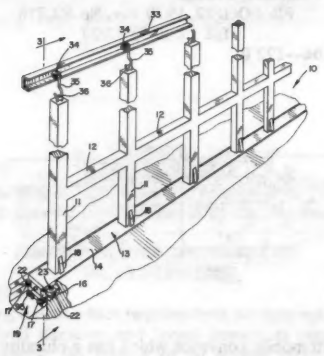
For Class 105—197 see:
Patent No. 3,677,363

3,677,191
RAILROAD HOPPER CAR WITH PLOW
Ernest J. Nagy, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.
Filed Dec. 12, 1969, Ser. No. 884,536
Int. Cl. B61d *7/00*
U.S. Cl. 105—248 **15 Claims**



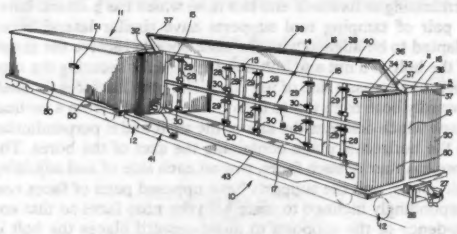
This invention relates to an ore plow which displaces the discharged lading from the surface of railway tracks to prevent a buildup of the lading which could result in a derailment. The ore plow is pivotally suspended beneath the car and operates in conjunction with the door operating levers, being lowered into position to clear the tracks when the hopper doors are opened and returning to an inoperative or raised position upon closing the hopper doors. The plow has a lower edge to clear ore off the rails and has plow deflecting members to divert ore away from the rails, or in alternate form plow deflecting member to divert the ore in between the rails.

3,677,192
CARGO HANDLING AND TRANSPORTATION SYSTEM
Norman E. Bateson, Munster, Ind., and William L. Pringle, Grosse Pointe Shores, Mich., assignors to Pullman Incorporated, Chicago, Ill.
Filed Aug. 21, 1970, Ser. No. 65,875
Int. Cl. B60p *3/06*
U.S. Cl. 105—368 R **3 Claims**



A cargo handling and transportation system includes a truss type of frame on which vehicles are suspended upon leaving the manufacturer's assembly line. The frame is connected to a longitudinal beam which moves in a track and transports the vehicles from the factory to a means of ground or highway transportation. In loading a railway car, the truss and vehicles thereon are removed from the longitudinal beam by a crane and are lowered through the open roof of the car into connecting relation with brackets disposed within the car so that the frame and cargo are ready for shipment. Similarly, the truss frames may be removed from the highway trailers or railway cars by lift mechanisms which shift the frames into aircraft or into holds of ships for further transportation. The longitudinal beams are movable in tracks below the ground, and may be removably connected to the lower ends of the truss to be transported therewith so that they may be guided in suitable track members in a ramp loading arrangement, such as may be desired for loading aircraft. The frames also may be stored within the hull of a ship or airplane fuselage in similar tracks which are engaged by the longitudinal beams removably connected to the lower ends of the truss frame.

3,677,193
RAILWAY CAR
William L. Pringle, Grosse Pointe Shores, Mich., assignor to Pullman Incorporated, Chicago, Ill.
Filed Aug. 21, 1970, Ser. No. 65,831
Int. Cl. B60p *3/06*; B61d *19/00*, *17/00*
U.S. Cl. 105—368 R **3 Claims**

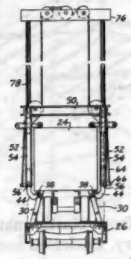


A railway car of articulated design is provided with identical car sections each of which includes an upright longitudinally extending truss structure on which vehicles or other cargo may be suspended. Each of the car sections is provided at its longitudinally outer ends with a laterally extending stabilizing member connected to the truss, said stabilizing members being supported on car trucks in a conventional manner. The sections are connected together by articulating means also supported on a conventional truck. The upright truss structure of each section is the primary structural member and is of a relatively narrow width which includes suitable bracket means on which vehicles or other cargo may be suspended on opposite sides thereof. The truss structure includes an upper longitudinally extending beam to which hinged roof panels are connected, pivotal to open and closed positions. The bottom of the car also includes a horizontal panel which is provided to enclose the bottom of the car and includes longitudinal and transversely extending track members in which the lower ends of a flexible enclosure or curtain are slidingly disposed. The hinged roof panels and upper supporting end structures, on opposite ends of each section, are also provided with transverse tracks within which the upper ends of a flexible enclosure are slidingly disposed. The flexible doors or closures are thus easily moved to stored positions whereby the sides of the car may be completely opened for loading purposes or locked to protect the cargo.

3,677,194
UNIT LOAD HOLD-DOWN AND MOUNTING

Leonard D. Barry, 19300 Pennington Drive, Detroit, Mich.

Division of Ser. No. 640,131, May 22, 1967, Pat. No. 3,528,569, Continuation-in-part of Ser. No. 591,369, Oct. 14, 1966, Pat. No. 3,483,829. This application Dec. 12, 1969, Ser. No. 884,566
Int. Cl. B60p 3/06; B65j 1/22
U.S. Cl. 105—368 B 21 Claims



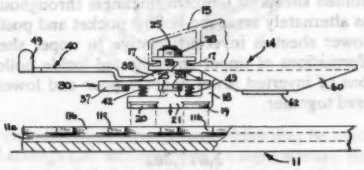
This invention adapts railway flat cars or other vehicles to secure a semitrailer on pedestals or a cargo container either on or between the pedestals. Automatic locking latches on the pedestals secure the trailer when set down thereon. A lifting device releases latches and lifts the load from the pedestals. The pedestals support the trailer bed at height above the bed of the car for trailer wheels to be relieved of carrying weight of trailer. The latches can be opened and a crank shaft turned to lower the pedestals and move them to the side to set the trailer on the bed of the car for endwise (circus-type) loading and unloading of trailers and for setting cargo containers or other loads on locking devices between the pedestals.

This invention relates to means to hold down, release and transfer cargo pallets, containers, or vehicles to vehicles for transportation or for storage and in particular to means to automatically hook a load down and to automatically release it when engaged.

3,677,195
ANCHOR FITTING FOR RETAINING ARTICLES IN A RETAINER TRACK

Ernest Prete, Jr., Woodland Hills, Calif., assignor to Ancra Corporation, El Segundo, Calif.

Filed Sept. 3, 1971, Ser. No. 177,788
Int. Cl. B61d 45/00; B60p 7/08
U.S. Cl. 105—369 A 14 Claims

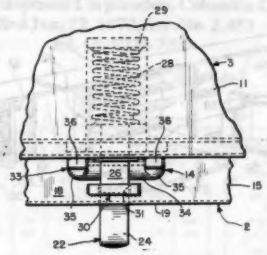


An anchor fitting has a pad member which fits into a slot of a track having a plurality of notched portions separated by narrow neck portions. The fitting has a camming lever which may be operated to drive a follower plate to cause the pad member, when it is positioned in the track in the slot opposite the neck portions, to be driven against such neck portions in holding engagement therewith.

3,677,196
COVERED HOPPER CAR

James J. Schuller, Dolton, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Dec. 19, 1969, Ser. No. 886,506
Int. Cl. B61d 39/00
U.S. Cl. 105—377 4 Claims

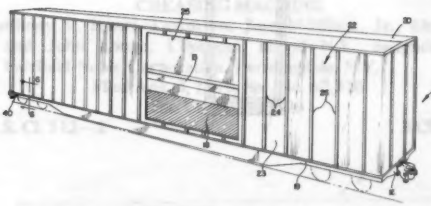


A covered hopper car having an open car body pivotally supporting between opened and closed positions a releasably lockable roof which may be hinged from either side while the other side is unhinged attendant to dumping a load through the open roof car body, the car body having mounted on each of its sides a plurality of releasable locking hinges connected to respective hinge structures on each of the car roof sides, each car body releasable hinge being provided with release plungers biased to the locked position and releasable by car rotating structure whereby one side of the roof moves away from the car during rotation and the other side remains hinged to permit the contents in the car body to fall outwardly therefrom.

3,677,197
FLEXIBLE MOVABLE ENCLOSURE FOR VEHICLES

James R. Hounshell, Flat Rock, and William L. Pringle, Grosse Pointe Shores, both of Mich., assignors to Pullman Incorporated, Chicago, Ill.

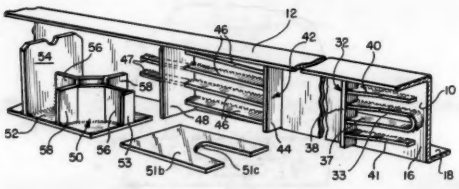
Filed Aug. 21, 1970, Ser. No. 65,832
Int. Cl. B61d 17/08, 19/00
U.S. Cl. 105—378 9 Claims



A vehicle such as a railway car or over-the-highway carrier is provided with a floor and roof construction which defines a cargo space enclosed by a flexible sliding wall of endless configuration. The wall includes an opening which upon the operation of an actuating mechanism is moved to a plurality of longitudinally spaced positions providing access to the cargo space from opposite sides of the vehicle. In one of the positions a solid vertical wall section masks the opening in the wall and the cargo space is fully enclosed.

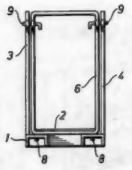
A modified construction includes a pair of flexible wall sections which are moved to open and closed positions by winch mechanisms.

3,677,198
DRAFT SILL ARRANGEMENT FOR HIGH CAPACITY CAR
Tung H. Yang, and John H. Spence, both of Munster, Ind., assignors to Pullman Incorporated, Chicago, Ill.
Filed March 25, 1971, Ser. No. 127,981
Int. Cl. B61f *1/00, 1/08*
U.S. Cl. 105—420 10 Claims



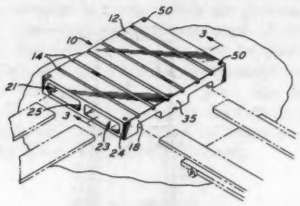
This invention relates to an improved lug arrangement used in a draft sill of a railway vehicle for transmission of coupler draft forces to the center sill. Vertical lug members are welded to both a key slot reinforcing member and to reinforcing ribs in such a manner as to more evenly distribute coupler draft forces from the vertical lugs through the reinforcing ribs and into the center sill. Sharp corners in the area of the elongated slot through which the coupler key may move have been eliminated to provide a draft gear key slot and front stop configuration capable of withstanding high forces.

3,677,199
ARRANGEMENT IN LOADING PALLETS WITH SUPPORTING WALLS
Karl Sigvard Rune Lindqvist, Grythyttan, Sweden, assignor to Combitainer S.A., Geneva, Switzerland
Filed Feb. 5, 1971, Ser. No. 112,948
Claims priority, application Sweden, March 25, 1970, 4139/70
Int. Cl. B65d *19/18*
U.S. Cl. 108—55 2 Claims



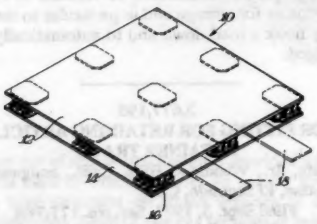
The invention is concerned with a loading pallet having two opposite parallel supporting side walls, a supporting rear wall and a detachable supporting front wall. The pallet also has a bottom frame shaped as a U, the open portion of said U facing said front wall and providing an attachment for said supporting walls. A bottom plate is placed on the bottom frame so as to fit between the supporting walls and adapted to be folded up against the rear supporting wall or one of the supporting side walls. The dimensions are such as to permit two similar loading pallets, viz. a first and a second loading pallet, with their front supporting walls and their bottom plates in folded-up position to be fitted together front to front so that the side supporting of the first loading pallet will be surrounded by two supporting side walls of the second loading pallet.

3,677,200
PALLET
Daniel T. Coccagna, 417 Jonathan Place, Philadelphia, Pa., and Salah Eldin A. El Damati, 6607 Bonnie Ridge Drive Apt. No. 201, Mount Washington, Baltimore, Md.
Filed Jan. 4, 1971, Ser. No. 103,455
Int. Cl. B65d *19/18*
U.S. Cl. 108—58 2 Claims



A pallet formed from plastic material including means to permit four-way entry. Encircled sockets are provided on two side faces of the pallet to permit the tines of a forklift truck to engage the pallet. The other two side faces of the pallet have openings to permit the tines of a hand truck to enter and engage the pallet. The pallet is constructed and arranged to provide substantial structural strength with minimum weight and is provided with a top non-skid surface.

3,677,201
PALLET
Gilbert R. Chadbourne, Oakland, Maine, assignor to Keyes Fibre Company, Waterville, Maine
Filed Dec. 17, 1969, Ser. No. 885,947
Int. Cl. B65d *19/18*
U.S. Cl. 108—58 14 Claims

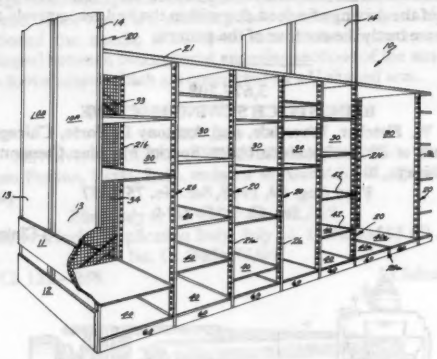


Pallet includes upper load bearing platform with plurality of composite support members secured thereto for spacing platform predetermined distance away from surface upon which pallet is resting. Each support member comprises upper and lower molded sheets of uniform thickness throughout. Each sheet has alternately arranged hollow pocket and post formations. Lower sheet is inverted relative to upper sheet with pocket formations of upper sheet nested inside hollow post formations of inverted lower sheet. Upper and lower sheets are secured together.

3,677,202
STORAGE SYSTEM
Herbert Young, West Hartford, Conn., assignor to Walter Kidde & Company, Inc., Grand Rapids, Mich.
Filed July 27, 1970, Ser. No. 58,214
Int. Cl. A47b *57/16*
U.S. Cl. 108—109 15 Claims

A storage system including a series of spaced, elongated, load-bearing members, each such member including two spaced uprights. Each of the uprights include opposed, spaced

surfaces, each such surface having a series of vertically spaced, tongue-like members extending upwardly therealong. Article supporting means such as shelves, hanger rods and the like are adapted to be suspended between two of the load-bearing members, the supporting means including at least four



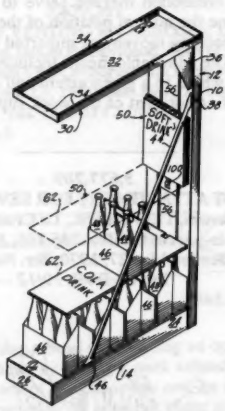
spaced tongue-like member engaging means, the spacing between said engaging means, said uprights and said bearing members being such that each of the engaging means is engageable with one of the tongue-like members on a different surface.

3,677,203

MERCHANDISE SUPPORT WITH HINGED SHELF

Wade H. Barrineau, De Kalb County, Ga., assignor to Southern Cross Industries, Inc., Atlanta, Ga.

Filed June 16, 1970, Ser. No. 46,768
Int. Cl. A47b *5/00*
U.S. Cl. 108—111 **13 Claims**



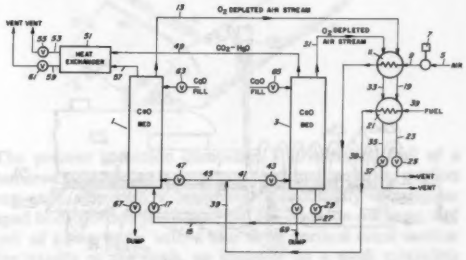
A merchandise shelf arrangement which may be used to display and arrange soft drink bottles in a supermarket. Each of a number of spaced shelves is hinged to a vertical support for vertical adjustment thereon relative to the merchandise above or below. The shelf may be injection molded with a plastic pressure adjustment bracket on one end to which the shelf is hinged along a living hinge of plastic material such as polypropylene material. The bracket is also hinged in two pieces along a plastic hinge line whereby the pieces may be confined in a channel in the shelf in place at a selected position while permitting manual relocation by applying pressure to the bracket. A flat spring inserted in the bracket and extending across the hinge line is "cocked" in place by the load of the merchandise whereby the shelf will rise when the load is removed.

3,677,204

HIGH TEMPERATURE HEAT GENERATOR

Lawrence E. Leas, Simi, Calif.; Robert L. Leas, and Cecil J. Johnson, both of Columbia City, Ind., assignors to Leas Brothers Development Corporation, Columbia City, Ind.

Filed Jan. 12, 1970, Ser. No. 2,451
Int. Cl. F23b *7/00*
U.S. Cl. 110—1 **5 Claims**



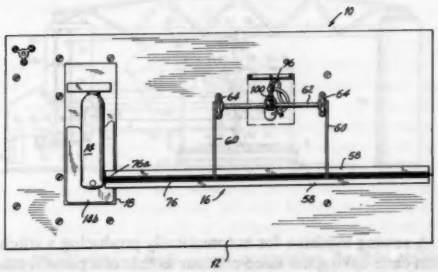
The present invention relates to a method and apparatus for generating high temperature heat in the range of 1,000° to 5,000° F. or within the range as limited by the materials of construction of the containment vessels. In the process of the present invention, single or multiple beds of cobalt oxide operating in series and/or parallel between two basic cycles of oxidizing and reducing of the metal oxide with air and fuel, respectively, discharges stack gas and heat alternately, thereby liberating very high temperature gases for various heating applications. The present invention uses many different types of fuel including gases, liquids, and/or solid fuel. In its metal oxidizing step, the lower oxide is oxidized with air to the higher oxide form liberating both heat and inert nitrogen. In the reducing step the chemical combined oxygen is used to burn the fuel thereby liberating high temperature heat for outside heating applications. The heat carrying gases are primarily carbon dioxide and/or steam depending on the type of fuel.

3,677,205

CREASING MACHINE

Anthony V. Igneri, Levittown; Joseph Milack, Jr., Elmont, and John Longo, Copiague, all of N.Y., assignors to Fairfield-Noble Corporation, Farmingdale, N.Y.

Filed Aug. 3, 1970, Ser. No. 60,316
Int. Cl. D05b *35/00*
U.S. Cl. 112—2 **3 Claims**



Apparatus for forming a permanent crease in fabric includes a work table and cooperating guide frame assembly for

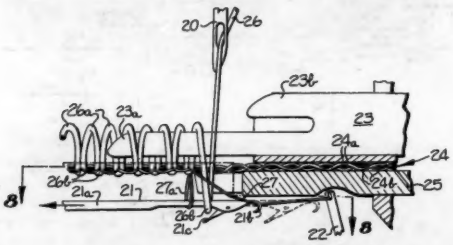
feeding flat lengths of fabric to a double needle sewing machine in a perfectly straight line with a longitudinal ripple of selected height at the desired crease location so that parallel rows of chain stitches inserted on opposite sides of the ripple draw the sides of the ripple together into a stitched fold forming a permanent crease.

3,677,206

APPARATUS FOR MAKING TUFTED FABRICS

John T. MacIsaac, Jr., and James E. Troy, both of Eden, N.C., assignors to Fieldcrest Mills, Inc., Eden, N.C.

Filed Jan. 29, 1971, Ser. No. 110,851
Int. Cl. D05c *15/22*
U.S. Cl. 112—79 R **10 Claims**



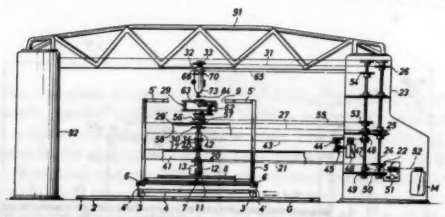
The apparatus includes cooperating tufting needles, pile formers and latch needles for forming pile tufts on a backing fabric while positioning small locking threads through lower bight portions on the tufts being formed to secure them to the backing fabric. To permit the use of less pile yarn for obtaining any given height of pile on the upper face of the backing fabric, the tufting yarns are under relatively high tension so that they are drawn upwardly relative to the backing fabric and so that portions of the locking threads passing through the lower bight portions are displaced upwardly into the backing fabric. Also, novel means are provided for guiding the locking threads into the hooks of the latch needles each time they enter through the tuft lower bight portions so that the latch needles will draw corresponding stitches of lockin thread through the respective lower bight portions.

3,677,207

SEWING MACHINE FOR SEWING PATTERNS

Hideo Iwase, 27-8,1-chome, Kamesawa, Sumida-ku, Tokyo, Japan

Filed April 7, 1970, Ser. No. 26,387
Claims priority, application Japan, May 20, 1969, 44/39257
Int. Cl. D05b *11/00*
U.S. Cl. 112—118 **6 Claims**



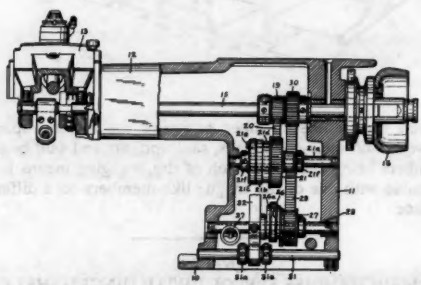
A sewing machine for automatically producing a stitch pattern each having the same contour as that of a pattern made of a plurality of straight and curved line segment rails arranged on a supporting frame which can move vertically and horizontally and carries a fabric to be sewn in tension, wherein the transmission of the movement of a guide pulley riding upon the rails, disposed within a detection box for detecting the curved line segment portions of a pattern is made independent of the transmission of a force driving the guide pulley and is carried away in synchronism through chains and chain wheels of all the same pitch diameters to an arm and a bed of the sewing machine which corresponding movement is made each independent of the oscillation of a needle bar within The arm and of the driving of a feed dog within the bed respectively to follow exactly the contour of the pattern.

3,677,208

BLINDSTITCH SEWING MACHINE

Roy W. Fletcher, Riverdale, and Anthony D. Forte, Chicago, both of Ill., assignors to Union Special Machine Company, Chicago, Ill.

Filed Aug. 19, 1968, Ser. No. 753,357
Int. Cl. D05b *1/24*
U.S. Cl. 112—178 **8 Claims**



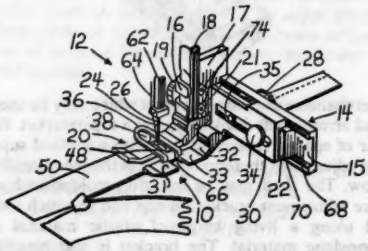
In a blindstitch sewing machine adapted to selectively produce non-skip stitches or skip stitches whenever desired, adjustable means for determining the normal position of a rockable work support carrying a node former to enable the machine to properly provide either type of stitching in work of different thicknesses and foldability. Said adjustable means and members controlled thereby serve to readily and accurately determine the normal position of the work support and the extent of rocking movement imparted thereto in forming skip stitches. The adjustable means includes a rotatable knob, the turning of which to a given extent will always provide the same extent of adjustment of the work support about its supporting axis.

3,677,209

ZIPPER FOOT ATTACHMENT FOR SEWING MACHINES

Leoda J. Gooderum, 1133 Vine St., La Crosse, Wis.

Continuation-in-part of Ser. No. 736,166, June 11, 1968. This application May 27, 1970, Ser. No. 40,900
Int. Cl. D05b *29/12*
U.S. Cl. 112—240 **14 Claims**



A presser bar attachment for sewing machines of different types, accommodating the sewing of zipper tapes to garments.

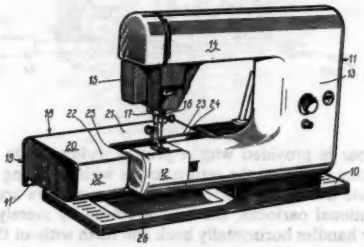
A pair of foot elements are adjustably spaced from one another forming a guide channel to receive and guide zipper chains of different widths while the foot elements are engagable with the garment fabric. Both foot elements are also adjustably spaced, in relation to the needle, and to opposite sides of the needle. When the main foot element is adjustably positioned the needle is received into an alignment slot formed in its edge confronting with the edge of the second auxiliary foot element. Also, when the auxiliary foot element is adjustably positioned the needle is received into a slot formed and developed between two material engaging sections of the auxiliary foot element which are connected by a U shaped arm.

3,677,210

SEWING MACHINE WITH BASE EXTENSION

Silvano Perlino, Pavia, Italy, assignor to Necchi S.p.A., Pavia, Italy

Filed July 6, 1970, Ser. No. 52,427
Claims priority, application Italy, July 21, 1969, 32415 A
Int. Cl. D05b *75/00*
U.S. Cl. 112—258 **5 Claims**



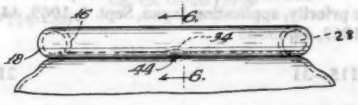
A base member for converting a cylindrical base sewing machine into one having a flat base, said member including a built-in accessory drawer.

3,677,211

METHOD OF VENTING AN AEROSOL DOME

Stanley J. Miller, and James P. Davidson, both of Chicago, Ill., assignors to National Can Corporation, Chicago, Ill.

Filed April 13, 1970, Ser. No. 27,780
Int. Cl. B21d *51/00*
U.S. Cl. 113—121 AA **11 Claims**



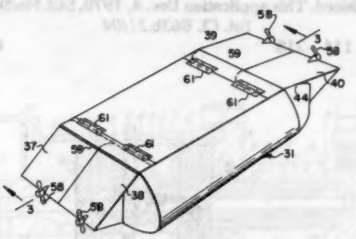
A method of forming a bead surrounding an opening in one end of a container body by rolling a neck extending from the body to a position where the free edge and an adjacent end portion of the neck overlap an adjacent outer surface of the body. A method contemplates rolling at least one selected portion of the neck to a smaller internal diameter than the internal diameter of the remainder of the neck so as to space a segment of the free edge from the outer surface of the body to provide a vent opening placing the internal area of the bead in communication with the surrounding outside area. In one embodiment, the smaller diameter portion of the bead is formed by producing projections extending above the free edge of the neck. A second embodiment contemplates outwardly deforming a selected portion of the neck and, in a third embodiment, the reduced diameter portion is deformed by inwardly deforming a selected portion of the neck.

3,677,212

SUBMERSIBLE WATERCRAFT

Resta S. Gregoire, Newport, Pa., assignor to Gregoire Engineering & Development Co., Adelphi, Md.

Continuation of Ser. No. 756,696, June 11, 1968, Pat. No. 3,512,494. This application May 18, 1970, Ser. No. 37,970
Int. Cl. B63b *1/10*
U.S. Cl. 114—61 **9 Claims**



The present invention comprises a streamlined hull of a catamaran type having a tear drop sectioned pontoon portion along each side with a horizontal substantially rectangular shaped body portion fixed between the pontoon portions, and a pair of power pods with a tear drop vertical cross section taken axially of the craft, an impeller on a shaft extending from a motor in each pod through the pointed edge at the outer end of each pod, and each pair of pods being rotatably mounted for independent angular adjustment about a horizontal axis at each end of the craft, said horizontal axis extending substantially through the radial center of the round end of the tear drop section of the pods. The impeller drive motors are independently controlled for operation in either direction so that unique maneuverability is obtainable either on or under the surface of the water by proper coordination of the speed and direction controls for the operation of the four power pods, or even if only one pair of pods are operated to provide rolling, looping speed and direction controls. The power pod and cargo and operating equipment spaces are not closed for pressurization so that the outside walls of the hull body may be comparatively light even for operation at great depths since the same pressures are effective on both sides of these walls no matter how deep the operation. The spherical or tubular personnel housing portions of the hull, occupying only a small portion of the entire hull space, will be comparatively light in structure because of the smaller dimensional requirements.

3,677,213

SKIRTED AIR CUSHIONED PLANING HULL

Allen G. Ford, 6816 Old Stage Road, Rockville, Md.

Filed Sept. 17, 1970, Ser. No. 72,960
Int. Cl. B63b *1/38*
U.S. Cl. 114—67 A **1 Claim**

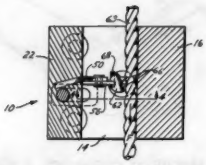
A modified planing hull vessel containing flexible stable seals completely surrounding the periphery of the hull except at the stern section where the hull itself acts as its own seal by being in close proximity with the water. The vessel rests on

both an air cushion confined within the area formed by the flexible seals and on a small wetted section of the bottom of the hull.

3,677,214
JAM CLEAT

Robert J. Bernstein, 764 Judson, Highland Park, Ill.

Continuation-in-part of Ser. No. 22,750, March 26, 1970, abandoned. This application Dec. 4, 1970, Ser. No. 95,049
Int. Cl. B63b *21/04*
U.S. Cl. 114—218 **6 Claims**

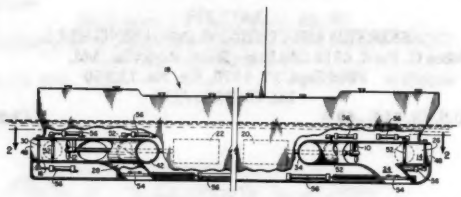


A jam cleat for use on sailboats and the like has a base adapted to be secured to a desired support surface. The base has an upper surface and a side wall perpendicular to the upper surface. A line-engaging member is mounted adjacent the base side wall and is pivotable in a first plane parallel to the base upper surface as well as in a second plane normal to the first plane. The relationship is such that as the axial load on a line loaded into the cleat between the line-engaging member and the adjacent side wall is increased, the line-engaging member is correspondingly pivoted in the first plane to jam the line in the cleat, whereas the line-engaging member is pivoted in the second plane when the line is removed from the cleat.

3,677,215
POWER ASSIST BARGE FOR OCEAN SERVICE

Robert D. Moss, 524 Lake St., Metairie, La.

Filed Jan. 25, 1971, Ser. No. 109,343
Int. Cl. B63h *25/46*
U.S. Cl. 115—16 **5 Claims**



A barge having fore and aft propellers respectively mounted in longitudinal tunnels has bottom intake and discharge respectively forward of their associated propellers and has combination intake and discharge ports at the outboard ends of said longitudinal tunnels. The respective end ports are guarded against entry of debris by a plurality of vertical vanes movably mounted to swing around their respective vertical axes for additional steering purposes. Respective transverse tunnels having combination intake and discharge side ports at their outer ends and joining the respective longitudinal tunnels at their inner ends are located forward of the aft propeller and aft of the forward propeller. Side ports are protected by grills to prevent entry of debris. Vertically installed valves are mounted in the respective tunnels adjacent the respective propellers for opening and closing the tunnels individually. Horizontally installed valves are mounted in the bottom intake ports for similar purposes. Extendable fins are recessed into the fore and aft sides of each side port, the forward side fins being extendable slanting aft and the after side fins forward for directing the flow therefrom. The placing of the bottom ports forward of their associated propellers enables the barge to lift and dig itself free if it should ever run aground. The extendable fin mounted adjacent the side ports assist in sterring the barge. The propellers are driven by engines that can also be remotely controlled. A radio antenna can receive control signals and electronically controlled machinery can be adapted to actuate all movable parts.

3,677,216
ROWING DEVICE

Arthur J. Gentemann, 16715 S.W. 17th Ave., Tigard, Oreg.

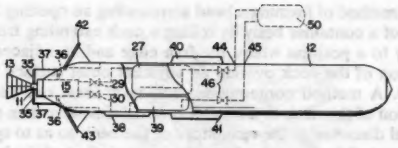
Filed July 29, 1970, Ser. No. 59,049
Int. Cl. B63h *16/04*, *16/06*
U.S. Cl. 115—24.1 **8 Claims**

An oar is provided with a pivotal paddle blade for self-feathering action on the return stroke without lifting the paddle blade out of the water. When two such cars are used in conventional oarlocks, the boat is rowed by merely moving the oar handles horizontally back and forth without the customary lowering of the handles on the return strokes. A boat may be propelled by a single on of such oars having a ball on the shaft of the oar to support the oar for pivotal movement in a vertical plane. The oar may thus be mounted on a transom bracket or on a pedestal housing in the bottom of the boat. By rotating the oar about its own axis to different positions, simple back and forth oscillation of the oar in different vertical planes will propel the boat backward, forward, sideways or in a turning movement, as desired.

3,677,217
MARINE PROPULSION DEVICE

Syozo Takimoto, 1-48 Minato Honcho, Aichi-ken, Handa-shi, Japan

Filed Aug. 18, 1970, Ser. No. 64,760
Claims priority, application Japan, Sept. 1, 1969, 44/69175; Sept. 2, 1969, 44/69885
Int. Cl. B63h *1/32*
U.S. Cl. 115—31 **21 Claims**

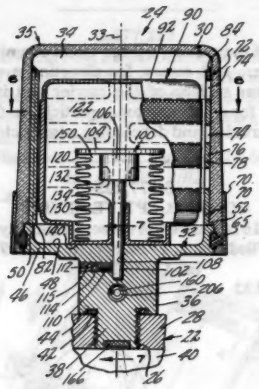


A marine propulsion device comprises a propulsion member reciprocating in a direction in which a ship body is propelled, and a funnel-shaped member attached to the rear end of said reciprocating propulsion member for expelling water backwards. Said funnel-shaped member is backwardly thrust by a strong force applied to said propulsion member.

3,677,218
FLUID PRESSURE VARIATION SENSOR AND INDICATOR

Thomas P. Dixon, Stratford, and Robert J. Worrell, Ansonia, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Continuation of Ser. No. 640,237, May 22, 1967, abandoned. This application Feb. 22, 1971, Ser. No. 117,476
Int. Cl. G01l 19/12
U.S. Cl. 116—70 9 Claims

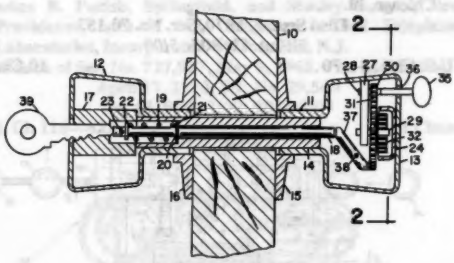


A pressure variation sensor and indicator having an expandable, sealed reference pressure capsule positioned within a sealed chamber subjected to a pressure under surveillance so that pressure differential across the walls of the capsule will cause the capsule to move within the chamber to indicate loss of the pressure under surveillance, rupture of the capsule or rupture of the indicator and including quick attach detach means to permit the easy replaceability and interchangeability of the capsule within the chamber without calibration.

3,677,219
LOCK WITH KEY ACTIVATING ALARM MECHANISM

Miguel Da Silva, 91 Old York Road, Somerville, N.J.

Filed Nov. 2, 1970, Ser. No. 85,891
Int. Cl. G08b 13/02
U.S. Cl. 116—80 1 Claim

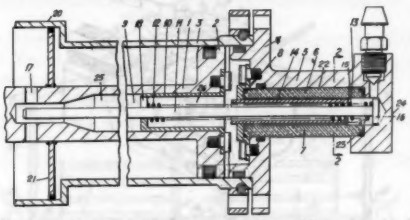


A mechanical alarm in a door closure assembly whereby the insertion of a key into the outside lock will set in motion a device which will cause an audible signal.

3,677,220
VOLUME INDICATOR FOR FLUID TANKS

Fritz Ostwald, Buchschlag, and Siegfried Hertell, Kelsterbach, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed June 5, 1970, Ser. No. 43,885
Claims priority, application Germany, June 6, 1969, P 19 28 850.7
Int. Cl. G01f 23/00
U.S. Cl. 116—118 7 Claims

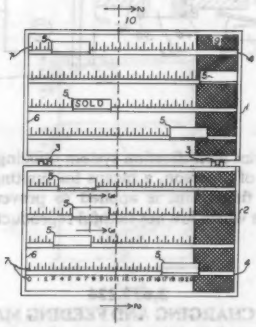


A fluid volume indicator for tanks having a follower, the position of which is directly proportional to the volume of the fluid in the tank and a visible indicator between the follower and a fixed wall, the indicator being movable along the axis of the follower and being acted upon by the two opposed helical compression springs, one between the indicator and the follower and the other one between the indicator and the fixed wall of the tank so that the movement of the indicator is proportional to the movement of the follower.

3,677,221
TALLYING DEVICES

Walter W. Giles, 2631 Locksley Place, Los Angeles, Calif.

Filed March 9, 1970, Ser. No. 17,532
Int. Cl. G09f 9/00
U.S. Cl. 116—135 1 Claim

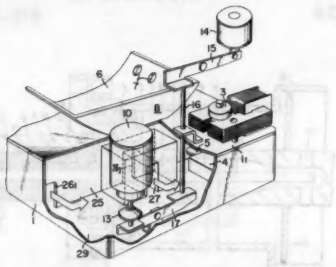


A tally board with tally indicators manually movable along scales of graduations on its face for tallying variable values is specified.

3,677,222
DEVICE FOR AUTOMATICALLY REGULATING THE CONCENTRATION OF DEVELOPING SOLUTION

Shigehiro Komori, Kawasaki-shi, and Hiroyuki Hattori, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1970, Ser. No. 5,794
Claims priority, application Japan, Feb. 24, 1969, 44/16745
Int. Cl. G03g *13/08*
U.S. Cl. 118—7 6 Claims

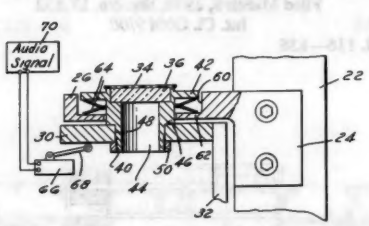


Device for automatically regulating the concentration of developing solution in a wet type electrophotographic machine. Stirrer means is used to stir the developing solution for circulation through a developing tray and a reservoir, and a concentration detector is disposed in the stream of developing solution. The concentration detector has a source of radiation such as light and two elements sensitive to the radiation and the detection circuit including two elements. The concentration detector provided within the stream can effect the regulation of concentration with high accuracy and stability.

3,677,223
PRESSURE SENSITIVE FINGERPRINT INPUT FOR IDENTIFICATION APPARATUS

William D. Hall, and Lewis H. Shaefer, both of Van Nuys, Calif., assignors to KMS Industries, Inc., Ann Arbor, Mich.

Filed Oct. 7, 1970, Ser. No. 78,838
Int. Cl. B05c *11/00*; B41r *1/00*
U.S. Cl. 118—10 2 Claims



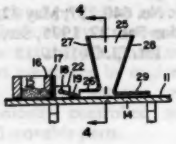
In a fingerprint identification system utilizing real time fingerprint input of a person, a means for limiting the pressure with which a fingerprint is applied to prevent illegible or smudged prints which are not faithful reproductions of the intended input.

3,677,224
TONER CHARGING AND FEEDING MACHINE

Alonzo W. Noon, Los Altos, Calif., assignor to Electroprint, Inc., Palo Alto, Calif.

Filed Sept. 18, 1970, Ser. No. 73,397
Int. Cl. B05c *11/00*
U.S. Cl. 118—63 17 Claims

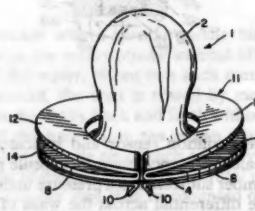
A toner charging and feeding machine using a generally flat carrier having a rough outer surface and means for driving the carrier along a predetermined path, toner supply means positioned across the carrier for depositing toner thereon, scraper means positioned across the carrier surface for scraping off excess toner deposited above the protuberances of the rough outer surface of the carrier, a toner cloud chamber positioned over the carrier, and means for directing a stream of air against the outer surface of the carrier and into the toner cloud chamber for entraining toner particles in the air stream, charging the particles, and developing a toner cloud.



3,677,225
CONTRACEPTIVE DEVICE

Julius Czirely, 1614 Palisade Avenue, Union City, N.J.

Filed Oct. 1, 1970, Ser. No. 77,269
Int. Cl. A61f *5/42*
U.S. Cl. 128—132 5 Claims

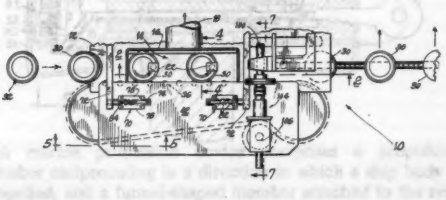


A contraceptive device the principal component of which is an elongated seminal container for attachment to the tip of a male organ such as by an adhesive layer applied over the inside edge of the container. Strippable protective webbing protects the adhesive layer until it is to be exposed for use. Suitably annular handling webbing is strippably attached onto the exterior of the container to facilitate handling prior to and during the application thereof.

3,677,226
APPARATUS FOR COATING ARTICLES

Lawrence D. Stepenske, and Edward K. Cassidy, both of Chicago, Ill., assignors to National Can Corporation, Chicago, Ill.

Filed Sept. 8, 1970, Ser. No. 70,153
Int. Cl. B05c *5/00*
U.S. Cl. 118—70 10 Claims



A conveyor for conveying disc like articles past a spraying station. The conveyor comprises a roller, link chain having a

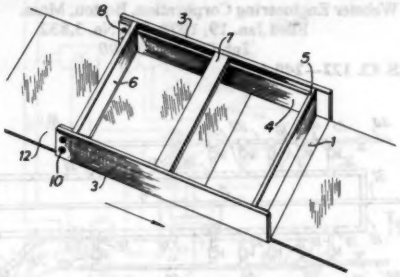
first flight extending along one side of a path for the articles, with articles being fed between adjacent pairs of rollers. A spring bar is positioned in a fixed location adjacent the opposite sides of the path to continually force the articles in tangential contact with the pairs of rollers. The spring bar also acts as a friction surface so that driving the flight of the chain along the path will move the articles past the spraying station and will simultaneously rotate the articles. The spraying station includes one spray head, a substantially rectangular spray pattern having a length greater than the diameter of the objects or articles and a second dimension substantially less than the diameter of the articles to prevent spraying of the chain and backing member.

3,677,227

COATING DEVICE FOR PRODUCING A THIN LAYER OF A FLUID OR SEMI-FLUID MATERIAL

Nils Goran Nybom, deceased, late of Kristianstad, Sweden (by Ethel Barbro Louise Nybom, administratrix), assignor to AB Instrumenta, Lund, Sweden

Filed Feb. 11, 1971, Ser. No. 114,643
Int. Cl. B05c *3/02*
U.S. Cl. 118—415 **6 Claims**



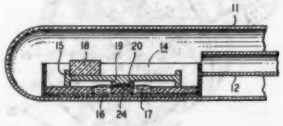
To coat the upper surface of a file of plates laid in end-to-end relation, a box frame containing the material to be applied and having an open bottom is moved longitudinally of the file of plates. The thickness of the coating is determined by vertical adjustment of the lower edge of a trailing and transversely extending control bar on the frame above the upper surface of the plates, the frame also being provided with a leading transversely extending control bar which engages the upper surface of the plates and lateral guide walls engageable with the sides of the plates for longitudinal guidance of the frame. Sealing strips located at the inside surface of the laterally positioned guide walls function to maintain a uniform thickness of the applied coating regardless of variations in plate thickness.

3,677,228

CRYSTAL GROWTH APPARATUS

Morton B. Panish, Springfield, and Stanley Sumski, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 727,927, May 9, 1968. This application April 17, 1970, Ser. No. 29,540
Int. Cl. B05c *3/00*; B01d *9/00*
U.S. Cl. 118—422 **1 Claim**



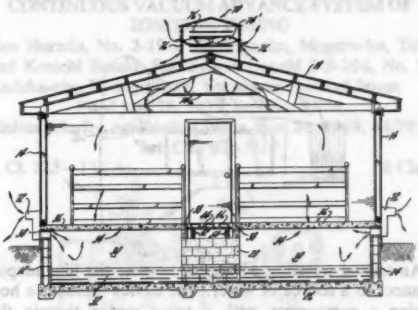
A crystal growth apparatus suitable for preparing epitaxial films of Group III(*a*) – V(*a*) compounds by tipping techniques is described. The novel apparatus includes means for removing deleterious oxides from the surface of source solutions prior to the deposition thereon of seed crystals.

3,677,229

LIVESTOCK CONFINEMENT HOUSE WITH IMPROVED ENVIRONMENTAL CONTROL

Ronald S. Blough, Fairfield, and Norval Curry, Ames, both of Iowa, assignors to Fairfield Engineering & Manufacturing Company, Fairfield, Iowa

Filed July 30, 1970, Ser. No. 59,654
Int. Cl. A01k *01/00*; F24f *07/06*
U.S. Cl. 119—16 **12 Claims**



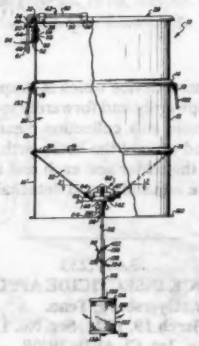
A livestock confinement house having a waste disposal pit and a slotted concrete floor positioned over the pit. The slotted floor comprises a plurality of elongated concrete slats spanning the pit, with each of the slats having a conduit positioned therein to reinforce the concrete. The conduits are interconnected to form a floor circulation system through which a temperature controlling fluid may pass to alternately heat or cool the floor. Ventilating ducts communicating the exterior of the building with the pit coupled with reversible ventilating fans in the roof of the house permit air circulation either upwardly or downwardly through the slotted concrete floor. Valves in the floor circulation system permit selective temperature regulation or complete blocking of sections of the house floor from the circulation system.

3,677,230

FISH FOOD FEEDING APPARATUS

Alvin H. Braden, 130 Haverhill, San Antonio, Tex.

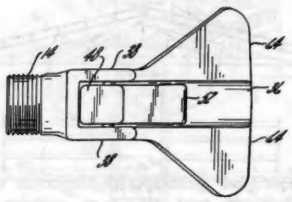
Filed Sept. 9, 1970, Ser. No. 70,820
Int. Cl. A01k *61/02*
U.S. Cl. 119—51 **9 Claims**



A hopper for holding a supply of fish food to be dispensed therefrom by the force of gravity, and including a normally

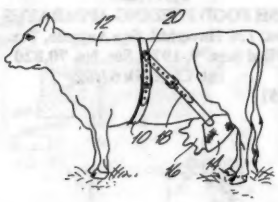
closed valve means disposed in the food dispensing path, the valve means being operable for movement to its open position to effect the dispensing of the fish food from the hopper upon forceable engagement thereof by a fish.

3,677,231
LIVESTOCK DRINKING DEVICE
Ronald S. Blough, Fairfield, Iowa, assignor to Fairfield Engineering & Manufacturing Company, Fairfield, Iowa
Filed Aug. 3, 1970, Ser. No. 60,672
Int. Cl. A01k *07/00*
U.S. Cl. 119—75 **10 Claims**



An animal watering device for hogs or the like adapted to connect to a source of water. The device includes a housing having a passageway with a valve means therein that is operated by an adjustable valve operator. The valve operator is partially positioned in a downwardly inclined spout that has outwardly extending web elements. The animal bites the spout and valve operator to open the valve means permitting the animal to drink the water. The web elements preclude operation of the device from any position other than substantially directly in front of it.

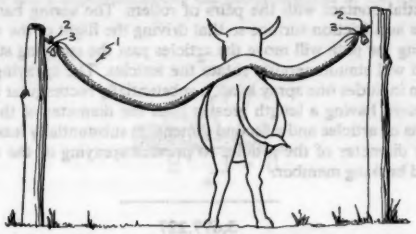
3,677,232
MILKING ASSISTANCE DEVICE
John Matthew La Croce, 40 Fulton Street, Middletown, N.Y.
Filed Sept. 8, 1970, Ser. No. 70,358
Int. Cl. A01k *29/00*
U.S. Cl. 119—146 **4 Claims**



A milking assistance device which is strapped around a cow to raise its udder upwardly and forwardly to permit proper attachment to a suitable milk collection means. A first adjustable strap is disposed around the heart girth, a canvas sheet is positioned behind the udder and each end is secured to strap members which are adjustably and detachably secured to the first strap.

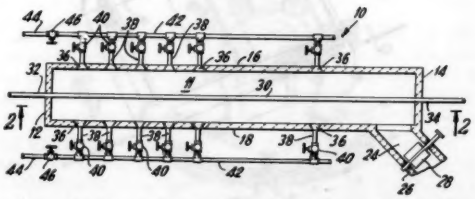
3,677,233
LIVESTOCK INSECTICIDE APPLICATOR
Pierce H. White, Jr., Dyersburg, Tenn.
Filed March 19, 1971, Ser. No. 126,107
Int. Cl. A01k *29/00*
U.S. Cl. 119—157 **10 Claims**

Livestock insecticide applicator in the form of an elongated member, circular in cross-section, adapted to be suspended by its ends for rubbing contact by animals. It is composed of a core of shearings, or clippings, from napped acrylic fabric, and



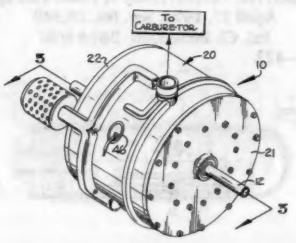
a cover of knitted, preferably rib-knitted, tubular Orlon, or similar material. The ends of the knitted tube are tied, and rings are secured to the tied ends for mounting the applicator.

3,677,234
HEATING APPARATUS AND PROCESS
Bronislaw K. Dutkiewicz, New York, N.Y., assignor to Stone & Webster Engineering Corporation, Boston, Mass.
Filed Jan. 19, 1970, Ser. No. 3,832
Int. Cl. F22b *31/00*
U.S. Cl. 122—240 A **8 Claims**



Furnace apparatus and process for heating a fluid. The furnace has an elongated heating chamber, a fluid conveying conduit which extends axially through the chamber, furnace burners and means to control the temperature profile and heat energy in the furnace. The heating chamber is provided with a flue gas outlet adjacent the conduit outlet. In operation, the furnace is fired differentially with the heaviest firing at the conduit inlet. The hot combustion gases from the burners flow parallel and cocurrently with the fluid in the conduit and discharge from the furnace at the flue gas opening.

3,677,235
ROTARY ENGINE
Murray R. Adkins, 1140 Pecan Circle, Rock Hill, S.C.
Filed Nov. 12, 1970, Ser. No. 88,837
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.35 **6 Claims**



A rotary internal combustion engine wherein a plurality of piston members oscillate between a position withdrawn within

a generally right circular cylindrical driven member and a position extended outwardly thereof, for cooperation with combustion chamber pockets spaced circumferentially about the driven member in applying force to the driven member at the extreme outer periphery thereof. Oscillatory movement of the piston members between the withdrawn and the extended positions proceeds under cam control, while the piston members are returned to a position substantially aligned with the driven member by cooperation with the combustion chamber pockets.

3,677,236

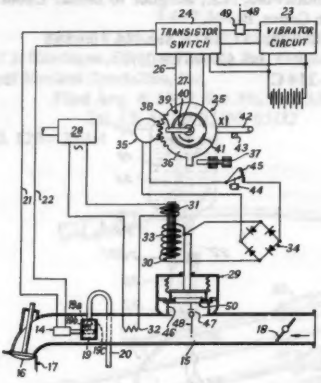
FUEL-INJECTION DEVICES FOR MIXTURE-ASPIRING INTERNAL-COMBUSTION ENGINES

Norman Moss, Ilford, England, assignor to The Plessey Company Limited, Ilford, England

Continuation-in-part of Ser. No. 727,976, May 9, 1968, abandoned. This application Sept. 8, 1970, Ser. No. 70,038

Int. Cl. F02m *51/06*

U.S. Cl. 123—32 EA **6 Claims**



To control the rate of fuel injection into the induction pipe of a combustion engine, a transistor switch is arranged to vary the length of each energization of a periodically energized ultrasonic transducer which produces fuel atomization by longitudinally vibrating the open outlet end of a fuel nozzle which leads into the induction pipe and in which the fuel pressure is kept in balance with the air pressure in the induction pipe.

3,677,237

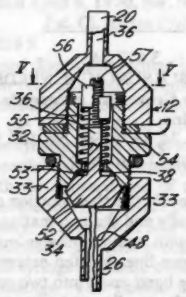
AUXILIARY AIR VALVE

Poul E. Hansen, Islington, Ontario, Canada, assignor to Emisco, Inc., c/o Carrick, O'Connor, Coutts & Cranne, Toronta, Ontario, Canada

Filed Dec. 21, 1970, Ser. No. 100,085

Int. Cl. F02m *23/00*; **F02d** *9/00*

U.S. Cl. 123—97 B **6 Claims**



The present auxiliary air valve controls admission of supplementary air to the fuel mixture of an internal combustion engine responsive to special demand. The device is comprised of a pair of body elements assembled to provide a valve housing with opposed inlet and outlet ports accommodating a suction displaceable valve normally spring-biased externally of said housing into flow-blocking abutment with the inlet port. The housing is expandable and contractable to vary the spacing of the ports and the degree of spring bias is also independently adjustable, thus affording control over both the minimum level of vacuum at which the device opens to admit auxiliary air to the intake manifold, and the maximum level of vacuum at which the supply of such air will then be reduced.

3,677,238

CONTINUOUS VACUUM ADVANCE SYSTEM OF IGNITION TIMING

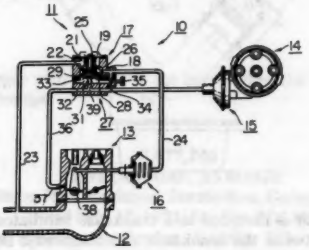
Motoo Harada, No. 2-19-2 Midorigaoka, Meguro-ku, Tokyo, and Kenichi Sasaki, Sakonyama Danchi 3-5-204, No. 157, Kodaka-cho, Hodogaya-ku, Yokohama, both of Japan

Filed Jan. 28, 1970, Ser. No. 6,474

Claims priority, application Japan, Jan. 31, 1969, 44/7916

Int. Cl. F02p *5/10*

U.S. Cl. 123—117 A **6 Claims**



A vacuum advance control system of ignition timing for reducing the hydrocarbon content of engine exhaust gases emitted especially during deceleration of a motor vehicle. The system is provided an advance control assembly composed of a vacuum operated sensing valve and a flow modulating needle valve cooperating with each other. The assembly operates in association with a conventional intake manifold, carburetor, distributor and distributor advance vacuum actuator in order to control continuously the level of the vacuum to be introduced into the actuator in response to the intake manifold vacuum which increases abruptly for the decelerating condition.

3,677,239

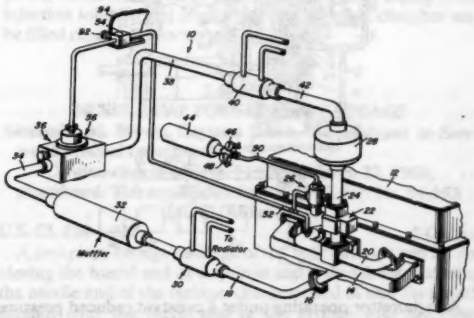
NON-POLLUTING EXHAUST SYSTEM FOR INTERNAL COMBUSTION ENGINES

James L. Elkins, Route 6, Box 312, Fayetteville, N.C.

Filed June 24, 1970, Ser. No. 49,488

Int. Cl. F02m *25/06*

U.S. Cl. 123—119 A **12 Claims**



Combustion products from the exhaust manifold of an internal combustion engine are recirculated through a filter to a

fuel mixing carburetor supplying a fuel mixture to the intake manifold. A metered flow of oxygen under pressure is supplied to the careburetor during engine operation for recharging the exhaust gas being returned to the engine as part of the fuel mixture.

3,677,240

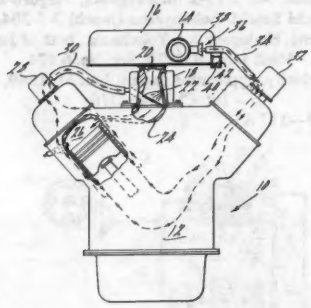
CRANKCASE VENTILATION

Jorma O. Sarto, Orchard Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 18, 1970, Ser. No. 90,591

Int. Cl. F02f *9/00*

U.S. Cl. 123—119 B **4 Claims**



An aspirator is included in a crankcase ventilator conduit extending between the crankcase and carburetor air cleaner for drawing air into the conduit when vapors flow therethrough from the crankcase thereby diluting them.

3,677,241

CARBURETTORS OPERATING UNDER A CONSTANT REDUCED PRESSURE

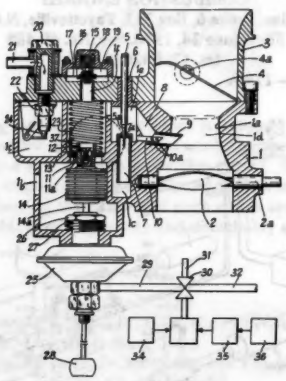
Pierre Gele, Odos Tarbes, and Bernard Laprade, Arudy, both of France, assignors to Les Usines Laprade S.A., Arudy, France, by said Bernard Laprade

Filed May 7, 1971, Ser. No. 141,161

Claims priority, application France, May 8, 1970, 7016860; Dec. 30, 1970, 704769

Int. Cl. F02m *7/06, 1/08*

U.S. Cl. 123—119 DB **6 Claims**



A carburettor operating under a constant reduced pressure comprising a mixing chamber formed in the intake manifold between the main and an auxiliary throttle valve, and fed with air and fuel by an emulsifying chamber, the input of air in which as required for idling and reduced load conditions, is controlled by a valve controlled in its turn by a vacuum chamber which is selectively connected with the atmosphere and with the intake manifold so as to make said valve close the corresponding input whenever the rotary speed of the engine is above a predetermined value and the main throttle valve is simultaneously closed or substantially so or else whenever the temperature of the engine cooling medium sinks underneath a predetermined value.

ERRATA

For Classes 123—148 thru 128—172 see:
Patents Nos. 3,677,253 thru 3,677,268

3,677,242

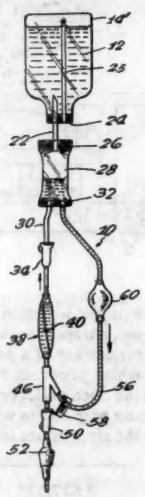
AIR BLOCK PREVENTION SYSTEM

Nat Shaye, Lindenwold, N.J., assignor to Baxter Laboratories Inc., Morton Grove, Ill.

Filed Jan. 11, 1971, Ser. No. 105,555

Int. Cl. A61m *05/16*

U.S. Cl. 128—214 C **8 Claims**



Air Block Prevention System for intravenous fluid administration sets or the like having a hydrophilic (i.e., wettable) filter utilizes a fluid filled purge line to permit air trapped above the filter when a solution container has run dry to be expressed from the fluid path so as to permit a continuation of fluid delivery to a patient without requiring withdrawal and reinsertion of the needle in the patient and without danger of air embolism.

3,677,243

SEPARABLE SURGICAL NEEDLE

Joseph E. Nerz, Willow Grove, Pa., assignor to Extracorporeal Medical Specialties, Inc.

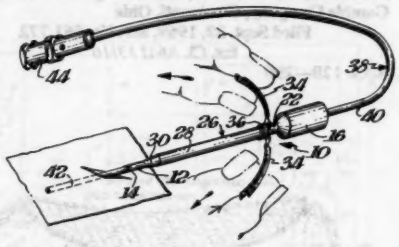
Filed Sept. 24, 1971, Ser. No. 183,572

Int. Cl. A61m *05/00*

U.S. Cl. 128—214.4 **10 Claims**

A hollow surgical needle the shaft portion of which may be split in half longitudinally and the two mating halves of which are secured together with heat shrinkable material which includes two parallel score lines located externally of the band to facilitate tearing the band apart into two separate pieces so that the two halves of the needle can be removed from around

a flexible tubular catheter having an enlarged fitting on one end after the other end of the catheter has been threaded



through the hollow needle and is properly positioned in the patient.

3,677,244

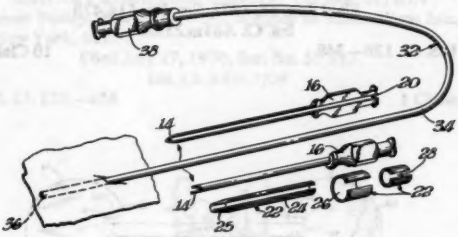
REMOVABLE CATHETER NEEDLE

Robert J. Hassinger, King of Prussia, Pa., assignor to Extracorporeal Medical Specialties, Inc.

Filed Aug. 4, 1969, Ser. No. 847,331

Int. Cl. A61m *05/00, 05/32*

U.S. Cl. 128—214.4 **4 Claims**



A hollow catheter needle which is split in half longitudinally and the two mating halves are secured together with heat shrinkable material which is easily cut by a sharp instrument such as a scapel and removed so that the two halves of the needle can be removed from around a flexible tubular catheter having an enlarged fitting on one end after the other end of the catheter has been threaded through the hollow needle and is properly positioned in the patient.

3,677,245

SELF-CONTAINED DISPOSABLE SYRINGE

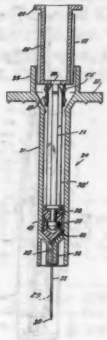
Joseph T. Welch, Skyline Lakes, N.J., assignor to Becton Dickinson and Company, East Rutherford, N.J.

Filed April 6, 1970, Ser. No. 26,021

Int. Cl. A61m *05/00*

U.S. Cl. 128—218 S **10 Claims**

A self-contained disposable syringe including a syringe barrel with an open rear end and a needle mounted on the forward end. The needle has a passage therethrough which communicates with the interior of the barrel. A plunger is positioned within the syringe barrel and is movable with respect to the barrel. A needle shield is normally positioned in sealing engagement with the forward end of the syringe barrel and surrounds the needle so as to protect the needle from damage and loss of sterility. A removable seal on the rear end of the syringe barrel normally provides a compact sealed self-contained disposable syringe in sterile condition and suitable for shipment and storage. The needle shield is adapted for removal from the forward end of the barrel and is adapted for engagement with the rear end of the plunger to form finger gripping means on said plunger to facilitate the movement of



the plunger with respect to the barrel when the sealed syringe is open for use.

3,677,246

HYPODERMIC SYRINGE

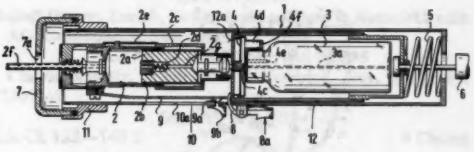
Walter Stein, 3591 Emdenau, Sanatorium, Germany

Filed Feb. 17, 1971, Ser. No. 116,108

Claims priority, application Austria, Feb. 19, 1970, A 1492/70

Int. Cl. A61m *5/20, 5/18, 5/24*

U.S. Cl. 128—218 G **10 Claims**



A hypodermic syringe which is provided with a relatively small injection chamber the volume of which is adjustable and from which an injection solution such as insulin or the like may be ejected by a piston through a hypodermic needle, and with a second relatively larger chamber, for example an ampoule, which is adapted to hold a relatively large supply of the injection solution and from which the injection chamber may be filled repeatedly for several injections.

3,677,247

NEEDLE CAP FOR SYRINGE PACKAGE

Alexander M. Brown, Daytona Beach, Fla., assignor to Sherwood Medical Industries Inc.

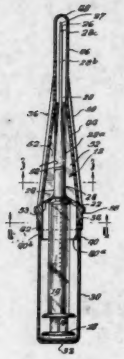
Continuation of Ser. No. 715,238, March 22, 1968, abandoned. This application Dec. 3, 1970, Ser. No. 94,953

Int. Cl. A61m *5/32*

U.S. Cl. 128—221 **5 Claims**

A two piece syringe package of the type having a cap for enclosing the barrel end of a syringe and a sheath for enclosing the needle end of the syringe, characterized in that the sheath extends over the barrel end of the syringe with the inner diameter of the sheath spaced from the barrel outer diameter,

and having a surface for receiving the cap on the outer diameter of the sheath, with the sheath further being provided with



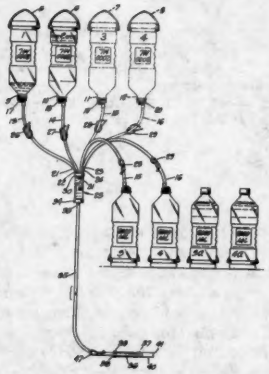
ribs on the interior thereof for centering the needle portion of the syringe during assembly, storage and shipment.

3,677,248

SURGICAL IRRIGATION APPARATUS AND METHOD OF USING SAME

Charles J. McPhee, Sylmar, Calif., assignor to American Hospital Supply Corporation

Filed Aug. 27, 1970, Ser. No. 67,375
Int. Cl. A61m *3/00*
U.S. Cl. 128—227 **19 Claims**



Apparatus for delivering large quantities of sterile medical liquid at both a fast flow rate and a low pressure to a resectoscope used by a physician in performing prostate surgery. Each of several 2-liter bottles suspended above the patient has an outlet tube providing for simultaneous concurrent flow of liquid and air between the bottle and an air trap chamber of the apparatus. In the process of maintaining a constant supply of bubble-free liquid to the resectoscope for flushing out blood and tissue, any randomly selected bottle of the apparatus that becomes empty can be disconnected from its outlet tube and replaced with a full bottle without disrupting the liquid supply to the air trap chamber from any other bottle of the apparatus.

3,677,249

ARCUATELY SHAPED SANITARY NAPKIN AND METHOD OF FORMATION

Darrel D. Kokx, Greenhills, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 29, 1969, Ser. No. 861,772
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 **6 Claims**

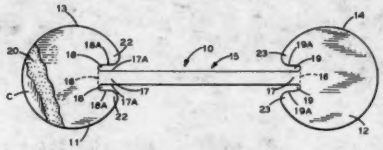
A sanitary napkin having an absorbent core held in longitudinally arcuate configuration by a snug fitting substantially inelastic outer cover, the end extensions of which are fastened immediately adjacent each core end.

3,677,250

TABBED ANCHORING TAPE MEANS

Morton I. Thomas, 125 South Street, Monroe, N.Y.

Filed Feb. 11, 1971, Ser. No. 114,478
Int. Cl. A61m *25/02*
U.S. Cl. 128—348 **10 Claims**



Adhesive tape for anchoring to a given substrate, elongated members such as surgical tubing or the like, consisting of at least one anchoring tab portion with strap means extending from the tab portion for wrapped engagement with the tubing; the strap means being connected to the tab portion in a manner to prevent peeling and separation of the tab portion from the substrate upon tensioning of the strap means; the tape being selectively used in a manner to (1) restrain the tubing against both lateral and longitudinal movement relative to the substrate; or (2) restrain the tubing only against lateral movement while permitting longitudinal movement relative to the substrate.

3,677,251

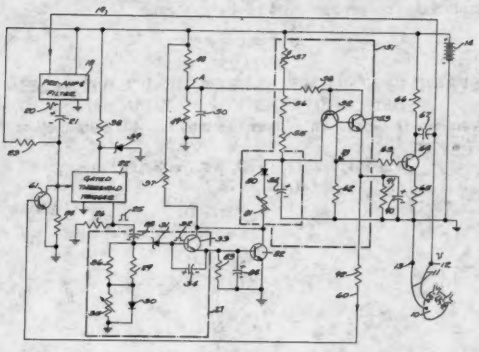
BODY ORGAN STIMULATOR WITH INTERFERENCE REJECTOR

David L. Bowers, West Allis, Wis., assignor to General Electric Company

Filed March 10, 1970, Ser. No. 18,132
Int. Cl. A61n *1/34*
U.S. Cl. 128—419 P **1 Claim**

A pace pulse generator connects to an organ which is to be electrically stimulated. Natural and artificial stimulating signals on the body are detected and used to control the pace pulse generator. An interference rejector distinguishes

between detected natural body signals and extraneous electrical interference. The rejector is also adaptable for control of



atrial and ventricular tachycardia and arrhythmia in connection with heart stimulators.

3,677,252

UNITARY BRASSIERE AND SLIP COMBINATION

Dianne Pedley, New York, N.Y., assignor to Maidenform Inc., New York, N.Y.

Filed July 17, 1970, Ser. No. 55,913

Int. Cl. A41c *3/08*

U.S. Cl. 128—454 **1 Claim**

A combined brassiere and slip, having the softness, lightness in weight and look of lingerie, in which the brassiere is formed with a front piece, which may be lined with a like piece, so cut and seam-joined at critical cut areas as to provide two fulled cups having stretch at opposed angular stretch lines, vertical stretch where it is not desired at the top of the cups, from their peaks inwardly, being resisted, whereas below the peaks of the cups and outwardly thereof, the cup fabric has stretch in the line of stretch resistance st the tops of the cups, or substantially so. This is the result of cutting the cup area of the fabric into three lower-marginal widely separated points, and moving the two outermost points into juxtaposition with the third and central point, where the points are seamed together and providing a rounded pair of fulled cups having the contradistinguished stretch lines aforesaid, then connecting a back band and skirt assembly, the latter preferably being lined as well as the brassiere element.

3,677,253

CAPACITOR DISCHARGE TYPE IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

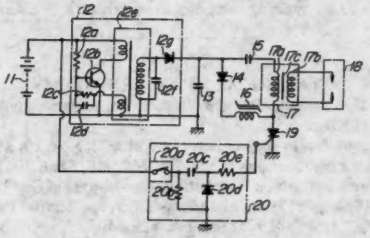
Kazuo Oishi; Tokuhiro Kurebayashi; Noriyoshi Ando; Noboru Yamamoto, and Hiroshi Yoshida, all of Kariya, Japan, assignors to Nippondenso Kabushiki Kaisha, Aichi-ken, Japan

Filed Aug. 20, 1970, Ser. No. 65,586

Claims priority, application Japan, Jan. 13, 1970, 44/3694

Int. Cl. F02p *3/06*

U.S. Cl. 123—148 E **20 Claims**



In a capacitor discharge type ignition system for internal combustion engines, which generates ignition sparks between electrodes of a spark plug by rapidly discharging a charged capacitor through the primary circuit of an ignition coil, the improvement residing in that the said primary circuit is provided with additional reactance elements so that said reactance elements constitute an oscillation circuit including said primary circuit, to thereby extend the duration of the ignition spark and ensure relative and effective operation of the ignition system.

3,677,254

THYRISTOR CIRCUIT ARRANGEMENT, ESPECIALLY FOR PERIODICALLY SWITCHING-IN AND SWITCHING-OUT A LOAD

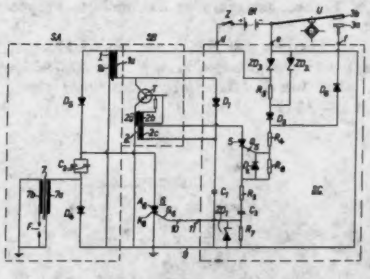
Rudolf Diener, Zurich, Switzerland, assignor to Autoelektronik AG, Graubunden, Switzerland

Filed Nov. 17, 1970, Ser. No. 90,385

Claims priority, application Switzerland, Nov. 20, 1969, 17307/69

Int. Cl. F02p *3/06*

U.S. Cl. 123—148 E **9 Claims**



A thyristor circuit arrangement, especially for periodically switching-in and switching-out a load, comprising a thyristor including a control electrode and an ignition circuit electrically coupled with such control electrode. The circuit embodies a control transmitter-switch means capable of being switched into a first and second switching state for controlling the ignition sequence, and upon switching of such control transmitter switch means from its first switching state into its second switching state the thyristor fires. The invention contemplates that the ignition circuit embodies an ignition capaci-

tor electrically coupled with the control electrode of the thyristor in order to fire such thyristor by means of a charging current surge. The ignition capacitor can be connected for charging, by means of an auxiliary control circuit and electronic switch means electrically coupled with said auxiliary control circuit, with a charging voltage source, and for discharging can be connected with a discharge circuit. The control transmitter-switch means controls the auxiliary control circuit and the discharge circuit, so that during switching of such control transmitter-switch means from its first switching state into its second switching state the electronic switch means is switched-in with the discharge circuit open, and in its first switching state closes said discharge circuit.

3,677,255

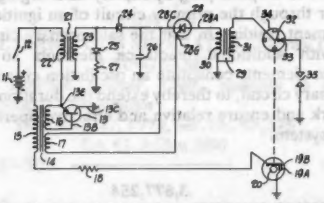
ELECTRICAL IGNITION SYSTEM

Donald D. Withem, Chagrin Falls, Ohio, assignor to Eleanor Burditt Krost

Continuation-in-part of Ser. No. 871,672, Nov. 19, 1969, which is a continuation of Ser. No. 767,915, Sept. 30, 1968, abandoned, which is a continuation-in-part of Ser. No. 570,845, Aug. 8, 1966, abandoned. This application Feb. 18, 1971, Ser. No. 116,440

Int. Cl. F02p *3/06*

U.S. Cl. 123—148 E **57 Claims**



An automotive ignition system in which a storage condenser or capacitor is charged during the time that the points or contacts are closed, the condenser or capacitor being charged from a source of DC energy through a power supply circuit that steps up the voltage.

3,677,256

FUEL INJECTION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

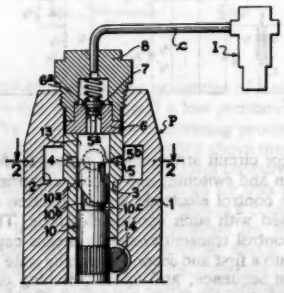
Marcel Regneault, Paris, and Maurice Le Creurer, Taverny, both of France, assignors to Automobiles Peugeot, Paris, France

Filed Aug. 26, 1970, Ser. No. 67,173

Claims priority, application France, Nov. 20, 1969, 6939888

Int. Cl. F02b *3/00*; F02m *39/00*

U.S. Cl. 123—32 G **9 Claims**



A fuel injection device for a pressure-ignited internal combustion engine having pumps in line, that is, in which each injection pump supplies fuel to one cylinder of the engine. There are in each piston and cylinder assembly of the injection pump, complementary means adapted to cooperate in at least one given angular position of, and in at least one part of the delivery stroke of, the piston so as to deduct a part of the fuel displaced in the course of said delivery stroke.

3,677,257

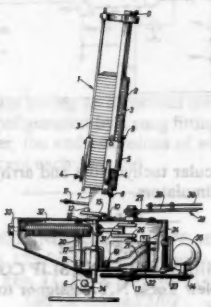
SPRING TYPE DISC PROJECTING DEVICE WITH CAM OPERATED COCKING MECHANISM

Bror Henrik Segerkvist, Ymsenvagen 9, 121 42, Johanneshov, Sweden

Filed Nov. 12, 1970, Ser. No. 88,965

Int. Cl. F41b *3/04*

U.S. Cl. 124—8 **7 Claims**



A target projecting device having a cam mechanism operated target transfer mechanism. The target transfer mechanism transfers the target from a magazine to a throwing arm. The cam mechanism is connected to the throwing arm so that movement of the cam will cause movement of the throwing arm. The magazine has a resilient bar that biases the targets against the side of the magazine and only when the bar is acted upon by a target transfer plate will a target be transfered to a target feed plate.

3,677,258

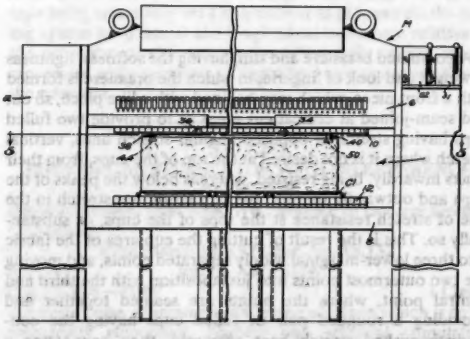
APPARATUS FOR CONTINUOUSLY GAUGING AND CUTTING STONE IN A GUILLOTINE TYPE CUTTING MACHINE

Ralph A. Fletcher, Bedford, N.H., and Joseph R. Oliver, Lowell, Mass., assignors to H. E. Fletcher Co., Westford, Mass.

Filed April 24, 1970, Ser. No. 31,608

Int. Cl. B28d *1/22*

U.S. Cl. 125—23 C **6 Claims**



Relatively large blocks of granite and other stone, weighing several tons or more, are conveyed into a guillotine type

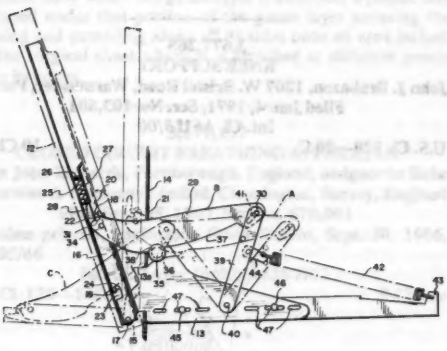
cutting machine and are quickly gauged and stopped in an aligned position to cutting chisels by means of a rigidly reinforced gauging stop mechanism. The gauging stop mechanism is uniquely combined with chisel adjusting mechanism of the guillotine machine so that very large bearing surfaces are provided for the stop mechanism to withstand heavy impact forces of a moving block. The gauging stop mechanism is movable downwardly into a gauging position for contacting an upper leading edge of a block of stone at points in front of the cutting chisels when the cutting chisels are raised. With the gauging mechanism in its lowered position, the cutting chisels are locked out of operation. The stop mechanism when moved upwardly releases the cutting chisels and simultaneously provide a cleared space into which cut-off sections of stone may be displaced forwardly of the cutting chisels without damage to the stop mechanism. The gauging stop mechanism further includes a set of detachable spacer plates of different sizes which are interchangeable to vary their spaced relationship to the upper set of cutting chisels.

3,677,259

REMOVABLE DOOR STRUCTURE

John T. Doner, Marion, Ohio, assignor to Whirlpool Corporation

Filed Nov. 4, 1970, Ser. No. 86,730
Int. Cl. F23m 7/00
U.S. Cl. 126—194 **11 Claims**



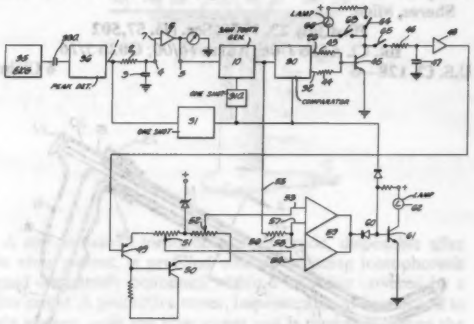
A door such as an oven door structure in which an enclosure such as the oven has an access opening with a door for closing the opening mounted for rotation about an axis between closed and open positions with the door being easily removable when desired by moving it to a position between open and closed and moving the door by pushing the door downward against a yieldable urging means in a direction to move a pin of each of two pairs of pins into alignment with a side opening in a slot, moving these pins through the opening followed by moving a second pair of pins out of their openings with the result that the door is completely removed from the enclosure. In the preferred construction a pivotally mounted link arm on each side of the door is movable about an axis spaced from the door axis so that the link arms and the door pivot at different rates and with a cavity in each arm that coincides with a pin removal slot only when the door is in its intermediate removable position so that the door can only be removed in the above manner in this intermediate position. An automatic safety catch is provided so that when the door is removed the hinge mechanism is prevented from closing against the enclosure prior to reinstallation of the door on the hinge mechanism.

3,677,260

ARRHYTHMIA DETECTOR

Horst Funfstuck, and Shmuel Elazar, both of Camarillo, Calif., assignors to Statham Instruments Inc., Oxnard, Calif.

Continuation-in-part of Ser. No. 69,796, Sept. 4, 1970. This application Sept. 4, 1970, Ser. No. 69,634
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 A **6 Claims**



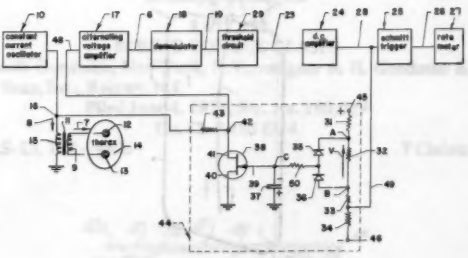
This application relates to means for measuring and recording variations in frequency of repetitive events which may be subject to large changes in frequency and is particularly useful in connection with the measuring and recording of the frequency of ectopic heartbeats. This is accomplished by generating the train of pulses responsive to the frequency of the events of interest, establishing a potential responsive to the frequency of said train of pulses, generating a linear sawtooth pulse whose amplitude is responsive to the frequency of the applied pulses and comparing said amplitude of said sawtooth pulse with a reference potential, establishing the difference between the amplitude potential and said reference potential, means responsive to said difference to indicate the frequency of the pulses resulting in said difference whose magnitude varies from that resulting from a predetermined variation of the frequency of said repetitive events.

3,677,261

IMPEDANCE PNEUMOGRAPH

Christopher C. Day, Newtonville, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed April 3, 1970, Ser. No. 25,353
Int. Cl. A61b 5/05
U.S. Cl. 128—2.1 Z **11 Claims**



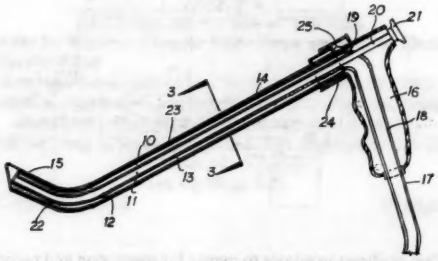
An impedance pneumograph, utilizing the change in thoracic impedance due to respiration to amplitude modulate a fixed amplitude electrical carrier signal applied to the thorax of a mammalian subject, wherein the modulation provides breathing rate information for monitoring purposes. A gain stabilizer circuit is provided to automatically adjust the gain

when the carrier component deviates from a predetermined voltage range, to be insensitive to fluctuations of the carrier component when it does not deviate from that predetermined range, and to be unresponsive to the modulation signal.

3,677,262
SURGICAL INSTRUMENT ILLUMINATING ENDOTRACHEAL TUBE INSERTER

Henry J. Zukowski, 72 N. Deeplands Road, Grosse Pointe Shores, Mich.

Filed July 23, 1970, Ser. No. 57,502
Int. Cl. A61b *1/06;* A61m *16/00;* G02b *5/16*
U.S. Cl. 128—6 **6 Claims**

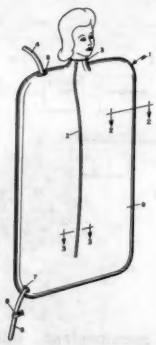


A surgical instrument used as an endotracheal tube introducer consists of a central curved fiberoptic bundle for viewing and a surrounding tubular fiberoptic bundle to carry light to the area to be viewed and an outermost metallic sheath to give rigidity. The distal end of the instrument is bent laterally at an angle so that it can be twisted to permit scanning around anatomical obstructions so that a path of entry can be found whereby the instrument will bypass obstructions without damage. The tube to be inserted is sleeved on the instrument with provision for detaching the tube after insertion into the trachea thereby permitting withdrawal of the instrument after intubation.

3,677,263
PORTABLE BATH CAPSULE

Frances Mignon Allen, 3685-31 Vista Campana N., San Diego, Calif.

Filed Sept. 16, 1970, Ser. No. 72,691
Int. Cl. A61h *29/00*
U.S. Cl. 128—24.1 **2 Claims**

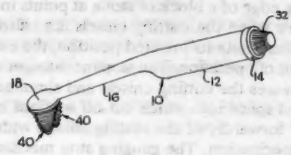


A capsule for administering bed baths and massage comprising an elongated sheath of flexible fluid tight material enclosing the patient except for the head and having means for admitting fluid to and drawing fluid from the capsule.

3,677,264
TOOTHBRUSH

Edwin Brockman, 31 Joseph Drive, Tonawanda, N.Y.

Filed Aug. 27, 1970, Ser. No. 67,352
Int. Cl. A61h *7/00*
U.S. Cl. 128—62 A **9 Claims**

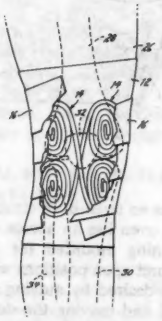


A toothbrush head having a pair of spaced, rotatable, hollow, generally conical implements mounted thereon for simultaneously cleaning the teeth and massaging the gums of the user. The conical implements are composed of rubber or other suitable resiliently yieldable material adapted to be pressed against and conform to the contours of the user's teeth and gums. The walls of the implements are corrugated and comprise a series of annular accordion pleats decreasing in cross section away from the head and terminating in bulbous formations. A plurality of perforations extend through the corrugated walls of the implements. The other ends of the implements are provided with shafts having axially extending shanks releasably secured into diametrically opposed gears meshing with a central idler gear captively received in the head of the toothbrush.

3,677,265
KNEE SUPPORT

John J. Brabazon, 1207 W. Bristol Road, Warminster, Pa.

Filed Jan. 4, 1971, Ser. No. 103,601
Int. Cl. A61f *3/00*
U.S. Cl. 128—80 C **10 Claims**



A knee support adapted to strengthen and protect injured knees. The support is particularly adapted for use by athletes. The support includes an elastic sleeve and an elastic covering which aid in strengthening the knee by retaining all of the tendons, ligaments, cartilage and muscles firmly in place. Coiled tubes of rubber are positioned between the elastic sleeve and the elastic casing, and are positioned above, below and on the sides of the kneecap when the device is worn. The coiled rubber tubes absorb any shock that may be inflicted on the knee, thereby protecting the injured knee.

ERRATUM

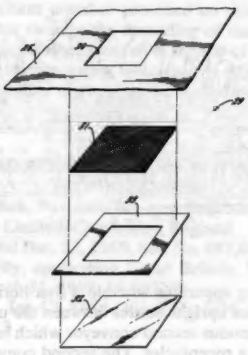
For Class 128—132 see:
Patent No. 3,677,225

3,677,266

GAUZE SECTION FOR A SURGICAL DRAPE SHEET

Angelica G. Green, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 31, 1970, Ser. No. 103,064
Int. Cl. A61f 13/00
U.S. Cl. 128—132 D 3 Claims



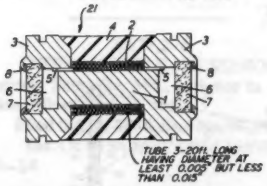
A surgical drape sheet forming an opening over which is placed a gauze layer extending under and onto the main surgical sheet body where the gauze layer is attached; a plastic film is placed under that portion of the gauze layer covering the opening and extending along all its sides onto an area including the surgical sheet where it is attached at different points along its edges.

3,677,267

CLOSED CIRCUIT BREATHING APPARATUS

Brian John Richards, Farnborough, England, assignor to Siebe Gorman & Company Limited, Chessington, Surrey, England

Filed Sept. 25, 1967, Ser. No. 670,061
Claims priority, application Great Britain, Sept. 30, 1966, 43,895/66
Int. Cl. A61m 16/00; A62b 7/02
U.S. Cl. 128—145.8 5 Claims



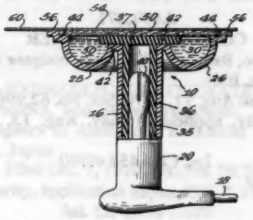
Closed-circuit breathing apparatus comprising a source of supply of a respirable gas, a user's mouthpiece or face mask, and a gas flow-regulating device between said source and mouthpiece or face mask. The gas flow-regulating device includes a tube having a length between 1 foot and 20 feet and an internal diameter between 0.002 and 0.015 inch, which tube prevents icing. The tube is mounted in a coil about a spool having a pair of flanged ends. One end of the tube passes through one flange and the other end passes through the other flange. Each tube end communicates with a recess in its respective flange end which recess is closed by a filter. The tube may be encapsulated between the flanged ends by a synthetic plastic material.

3,677,268

IONTOPHORESIS ELECTRODE

Richard A. Reeves, Creve Coeur, Mo., assignor to Sherwood Medical Industries Inc.

Filed Nov. 28, 1969, Ser. No. 880,767
Int. Cl. A61n 3/06
U.S. Cl. 128—172.1 8 Claims



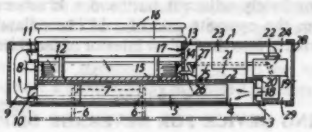
A self-contained iontophoresis electrode, disposable after use on a patient, is prefilled with an inducing iontophoresis liquid completely contained within a chamber covered by a filter cover. A protective cover, impenetrable to liquids and to light energy, seals the filter cover and is removable when the electrode is to be used.

3,677,269

TOBACCO ADDITIVE DEVICE

Perry B. Hudson, New City, N.Y., assignor to American Chemosol Corporation, New York, N.Y.

Filed March 23, 1970, Ser. No. 21,659
Int. Cl. A24b 09/00, 15/04; A24f 25/00
U.S. Cl. 131—134 7 Claims



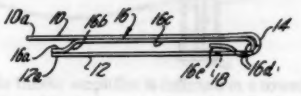
The invention provides apparatus for treating prepared tobacco by inserting the tobacco in an enclosure, either as "loose" tobacco alone or in a temporary container or as a smokers' article such as a cigarette, cigarillo or cigar, and applying suction or fluid pressure across the matrix of tobacco so as to result in a flow of fluid therethrough for the purpose of introducing a treating substance to be carried by the flow of fluid into the tobacco.

3,677,270

SPRING-TONGUE CLASPS

Jacob Goodman, New York, N.Y., assignor to H. Goodman & Sons, Inc., Kearny, N.J.

Filed June 4, 1971, Ser. No. 150,039
Int. Cl. A45d 8/24
U.S. Cl. 132—48 R 7 Claims



Clasps for use as barrettes and bobby pins include spaced-apart top and bottom strips extending from a rounded bend to free tips. A resilient tongue extends between the top and bot-

tom strips, close to or against the top strip for most of its length. At one extremity, the tongue is united to the tip of the bottom strip. At the other extremity, the tongue has an end part that extends into an opening in the bottom strip near or at the bend that connects the top and bottom strips. In use, the tongue and the top strip grip a lock of hair with distributed pressure, and there is practically no chance of hair being caught or snagged anywhere in the clasp.

3,677,271

COSMETICS CONTAINER

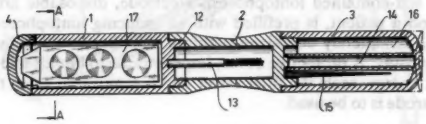
De Pietri Luciano, Reggio Emilia, Italy, assignor to Intercosmo s.n.c., Bologna, Italy

Filed Aug. 11, 1970, Ser. No. 62,996

Claims priority, application Italy, Aug. 13, 1969, 33619 A/69

Int. Cl. A45d *40/00*

U.S. Cl. 132—79 **1 Claim**



A container for cosmetics, means for applying the cosmetics, and means for aiding in the application of the cosmetics, comprises three tubular parts releasably interconnectable one with another. The hollow interior of each part may be divided into a plurality of compartments for receiving different cosmetics. An eyelash stretcher extends outwardly from the end of one part and extends into the hollow interior of the immediately adjacent part and a brush extends outwardly from the opposite end of said immediately adjacent part and extends into the hollow interior of the third part.

3,677,272

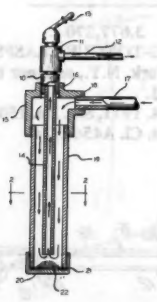
CLEANING DEVICE FOR BEVERAGE DISPENSERS

Shirley L. Schrank, 3540 So. Shore Drive, Hubertus, Wis.; John M. Berelc; Dorothy C. Berelc, both of 4530 N. 49th St., Milwaukee, Wis., and Charles O. Shrank, 3540 So. Shore Drive, Hubertus, Wis.

Filed Nov. 23, 1970, Ser. No. 91,673

Int. Cl. B08b *9/06*

U.S. Cl. 134—93 **5 Claims**



A tubular housing receives the pipe of a standard beer keg tap or pump. Water is forced, under pressure, through the tubular housing, pipe and pump in order to clean it out.

3,677,273

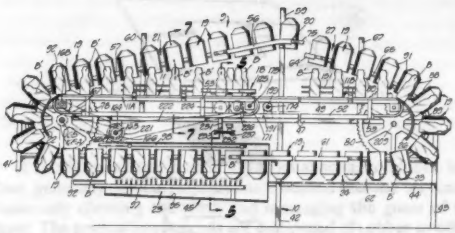
BOTTLE RINSING APPARATUS

Gerald F. Mahlstede, Brea, and Buster L. Carruth, Placentia, both of Calif., assignors to Polar Chilled Products Co., Inc., Brea, Calif.

Filed Jan. 5, 1970, Ser. No. 745

Int. Cl. B08b *3/02, 9/08*

U.S. Cl. 134—127 **12 Claims**



Bottle rinsing apparatus wherein a first horizontal receiver conveyor carries upright bottles between the upper and lower runs of a continuous second conveyor which has a plurality of bottle receiving receptacles. The second conveyor has a first upper run segment in which receptacles are carried downwardly at an angle to the first conveyor so as to respectively encompass a bottle on the first conveyor. The encompassed bottles are inverted by the receptacle conveyor and passed over rinsing jets on a lower run segment of the second conveyor. Each bottle receptacle is open at both ends, with one end having a restricted opening to retain the bottle neck when the bottle is inverted, while still affording a path to the bottle interior for the rinsing jets and for drainage. The second conveyor has a second upper run segment in which the receptacles are carried upwardly at an angle adjacent a horizontal retrieval conveyor which receives the bottles in upright position from the receptacles.

3,677,274

UMBRELLAS

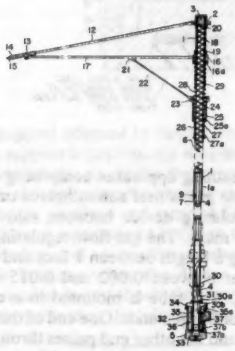
Hiroyuki Yasuda, Funabashi, and Choji Arai, Kitakatsushikagun, both of Japan, assignors to Kabushiki Kaisha Ideal, Tokyo, Japan

Filed July 17, 1970, Ser. No. 55,847

Claims priority, application Japan, July 23, 1969, 44/69770; July 23, 1969, 44/69771

Int. Cl. A45b *25/16*

U.S. Cl. 135—24 **3 Claims**



In a collapsible, automatically openable umbrella comprising: a telescopic dual shaft having a tubular inner lower shaft

member and a tubular outer upper shaft member, a compression spring means housed in said shaft for urging said members to mutually extended positions, a slidable tubular intermediate member pivotably carrying rib-supporting spokes, and a slidable tubular lower member pivotably carrying spoke-supporting rods, the opening of the umbrella is greatly facilitated by the provision of a slidable tubular push-up member urged upwardly by a compression spring provided in the bore of the grip secured to the lower end of the tubular inner lower shaft member, a resilient member provided on said tubular intermediate member or urge the spreading of the rib-supporting spokes. A buffer member secured at the top of the shaft serves to alleviate the impact arising when the top edge of the tubular intermediate member hits against the shaft top.

3,677,275

METHOD AND APPARATUS FOR CONTROLLING THE FLOW OF GASES

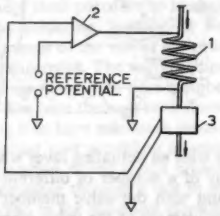
James E. Lovelock, Bowerchalke, near Salisbury, England, assignor to Pye Limited, Cambridge, England

Filed Dec. 22, 1969, Ser. No. 887,028

Claims priority, application Great Britain, Dec. 31, 1968, 61,981/68; March 31, 1969, 16,647/69

Int. Cl. F15d *1/02*; F15c *1/04*

U.S. Cl. 137—13 **9 Claims**



The invention relates to a method and apparatus for controlling the flow rate of a gas. The flow rate of a gas through a tube which is long compared to its internal diameter is inversely proportional to the gas viscosity, which in turn, is directly related to the square root of the absolute temperature of the gas and is independent of the gas pressure. The gas is passed through a single tube, or a number of interconnected tubes, the tube or tubes being heated electrically whereby to change the gas viscosity and hence flow rate. Changes in gas flow may be detected by a transducer to initiate a signal controlling the heating current.

3,677,276

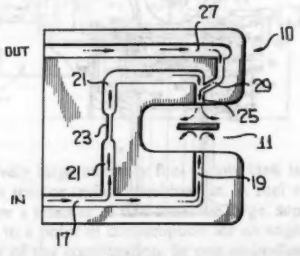
INTERRUPTIBLE JET SENSOR

Anthony Kopera, Beltsville, Md., assignor to Bowles Fluidics Corporation, Silver Springs, Md.

Filed Oct. 2, 1970, Ser. No. 77,595

Int. Cl. F15b *5/00*; G06d *16/00*

U.S. Cl. 137—14 **9 Claims**



Object presence in a gap is detected by a fluid jet issued across the gap toward a sensor opening and interruptible by the object. Supply and outlet passages communicate with the sensor opening. Jet interruption permits supply passage fluid to exit from the sensor opening and aspirate the outlet passage. The uninterrupted jet impacts supply passage fluid just outside the sensor opening, producing a back pressure in the opening which directs supply passage fluid into the outlet passage. Supply passage fluid pressure is selected to prevent entry of the unblocked jet into the sensor opening, thereby assuring flow of only clean supply fluid through the outlet passage.

3,677,277

MECHANO-HYDRAULICALLY OPERATED GOVERNOR

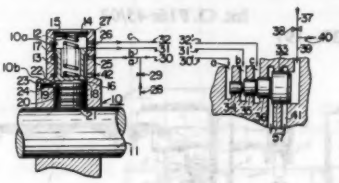
Koichiro Hirozawa, and Shigeo Takahashi, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Aichi Pref., Japan

Filed Oct. 7, 1970, Ser. No. 78,707

Claims priority, application Japan, Oct. 7, 1969, 44/80050

Int. Cl. G05d *13/36*

U.S. Cl. 137—54 **10 Claims**



A mechano-hydraulically operated governor is provided with a main body rigidly mounted on a rotational shaft and a supplemental control valve means operationally connected with the body. In the main body valve means are mounted on the shaft so as to be moved radially or axially relative thereto under the action of the centrifugal force generated by the rotation of the shaft.

Hydraulic output governor pressure can be varied in a stepped mode for a continuously increased or decreased rotation of the shaft.

3,677,278

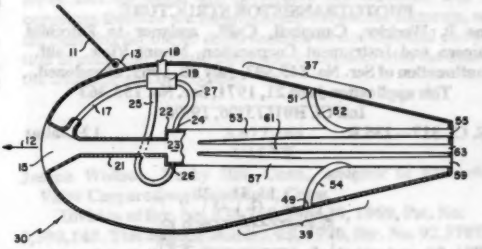
SELF ACTIVATED FLUIDIC CONTROL FOR A SUBMERGED TOWED BODY

John L. Joynes, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 25, 1970, Ser. No. 92,751

Int. Cl. F15c *4/00*

U.S. Cl. 137—81.5 **5 Claims**



A bi-stable fluidic amplifier is inserted in a towed body. The nose of the towed body is opened to admit fluid, which is funnelled under the force of the flow stream into the fluidic amplifier. A passive pressure sensor, preset to a desired depth or altitude controls the direction of the fluid leaving the fluidic device through exit conduits connected from the fluidic

device, one to the upper and one to lower surface of the towed body. These exit lines terminate at approximately the separation point of the fluid flowing around the body. The pressure regulator reacting to changes in depth directs a control signal to the fluidic amplifier to divert the passage of the fluid to either the upper or lower exit conduits, depending upon the pressure. Fluid from an exit port is entrained back along the side of the body causing the separation point on that side of the body to move back along the body thereby increasing lift on that side of the body. The change in the lifting force on one side of the body without an equal change on the opposite side forces a change in the attitude or angle of attack of the body to the fluid so it will either plane towards the surface or dives, until the body reaches the pressure level preset on the pressure sensor.

3,677,279

AUTOMATIC GAS-TRAP

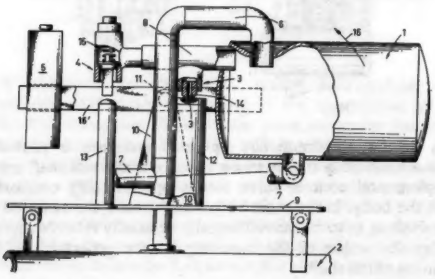
Henri Lenfant, Heppenbach, Belgium

Filed Sept. 24, 1970, Ser. No. 74,952

Claims priority, application Belgium, Sept. 26, 1969, 739,453

Int. Cl. F16r *45/02*

U.S. Cl. 137—197 **2 Claims**



An automatic gas-trap for discharging undesirable gas accumulation in a liquid chamber. The chamber is mounted for movement between a first, gas relief position, and a second, closed position. Two valves are arranged on a rigid duct attached to the chamber, both valves being designed to open when the chamber moves to the first position to enable expulsion of the gas therefrom. When gas pressure is reduced inside the chamber, the chamber moves back to its second position which corresponds to the closing of the two valves.

3,677,280

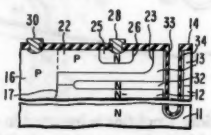
OPTIMUM HIGH GAIN-BANDWIDTH PHOTOTRANSISTOR STRUCTURE

Gene P. Weckler, Campbell, Calif., assignor to Fairchild Camera and Instrument Corporation, Mount View, Calif.

Continuation of Ser. No. 845,303, July 28, 1969, abandoned. This application June 21, 1971, Ser. No. 155,363

Int. Cl. H01l *15/06, 19/00*

U.S. Cl. 317—235 R **12 Claims**



The fabrication of two semiconductor structures such as a high speed, optimum sensitivity photodiode and a maximum gain-bandwidth transistor on the same wafer is described. A thin, low resistivity layer is formed on a higher resistivity substrate and the diode junction is then formed in one part of the wafer by diffusing the junction-forming region through the layer and down into the substrate. This provides a diode of low capacitance and optimum light sensitivity. The transistor is then formed in another part of the same wafer by first diffusing the base-collector junction into the thin layer followed by a diffusion therein of the emitter-base junction. This diffusion into the layer is very shallow and results in a high gain-bandwidth transistor. The photodiode structure is affected very little by the processing required to form the transistor, thus allowing each structure to be independently optimized.

3,677,281

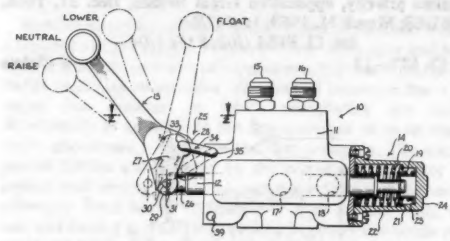
CONTROL VALVE AND ACTUATING LEVER ASSEMBLY THEREFOR

Francis H. Tennis, Oconomowoc, Wis., assignor to Hydraulic Industries, Inc., Hartland, Wis.

Filed Aug. 28, 1970, Ser. No. 67,710

Int. Cl. F16k *31/28, 31/46*

U.S. Cl. 137—270 **6 Claims**



A control valve with an actuating lever which is selectively connectible in any of a number of different attitudes with a supporting link and with the valve member to be actuated. Lever produced movement of the valve member to one of its operating positions effects cocking of a toggle joint defined by the link and part of the lever connected thereto. The return spring acting upon the valve member yieldingly holds the toggle joint in cocked condition.

3,677,282

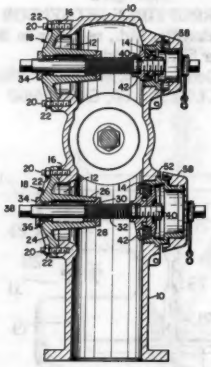
FIRE HYDRANT

Edward Page, Walnut Creek, Calif., assignor to Rich Manufacturing Company of California

Filed Dec. 24, 1969, Ser. No. 887,955

Int. Cl. E03b *9/04*; F16k *31/50*

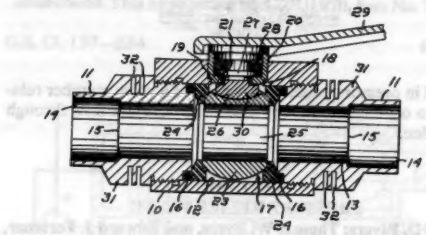
U.S. Cl. 137—283 **6 Claims**



A fire hydrant having a water filled housing and easily removable operating valves. The valves are carried on bolted-

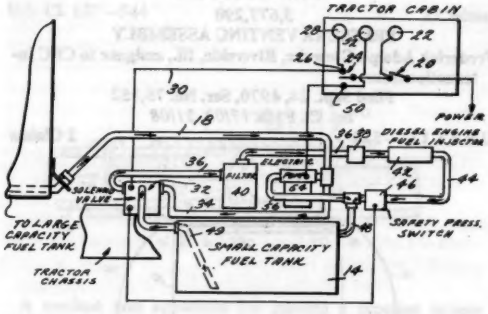
in assemblies and provided with screw-in valve seats against which the valves operate. The valve assembly has a removable valve carrier which permits substitution of slow opening or quick opening valve parts.

3,677,283
BALL VALVE
Kostag V. Tito, 14 Forest Street, Saco, Maine
Filed April 16, 1970, Ser. No. 29,179
Int. Cl. F16k *49/00*
U.S. Cl. 137—338 **4 Claims**



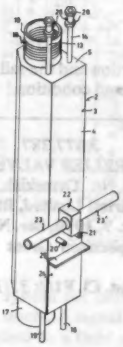
Ball valves are disclosed that are particularly adapted for constructions where their ports are to have conduit ends connected thereto by soldering, brazing, or welding. For such uses, the sealing means of the valves are protected by a heat-dissipating fin arrangement. The valve bodies preferably consist of sleeve-like members with port members threaded into the ends thereof. The bore through each sleeve-like member is eccentric enabling it to have minimum cross-sectional dimensions with its thickest part providing adequate stock for the support of the operating means which preferably consist of a key on a stem insertable through a slot in the bottom of the bonnet into a keyway in the ball valve element and seating the stem when the key is caught under the bottom of the bonnet.

3,677,284
FUEL TRANSFER SYSTEM FOR TRACTOR TRAILER VEHICLES
Charles E. Mendez, P. O. Box 426, Tampa, Fla.
Filed Oct. 6, 1966, Ser. No. 584,867
Int. Cl. F17d *1/00*
U.S. Cl. 137—351 **6 Claims**



A relatively large auxiliary fuel supply tank is carried by a trailer of a tractor-trailer combination. A fuel supply system provides for a transfer of fuel from the large, separate tank of the trailer to a point of consumption for an engine carried by the tractor of the combination. In one embodiment, fuel can be transferred from the separate fuel tank to the engine itself by a conventional fuel pump carried by the engine, and in another embodiment fuel can be transferred from the separate fuel tank into one or more small-capacity fuel tanks carried by the tractor. Automatic control means are provided for maintaining a desired level of fuel in the small-capacity fuel tanks in the second embodiment.

3,677,285
DUCT ASSEMBLY UNIT FOR AIR-WATER INDUCTION SYSTEM OF AIR CONDITIONING IN MULTI-STORY BUILDINGS
Wade L. Adams, 735 Bowhill, Hillsborough, Calif.
Filed April 6, 1971, Ser. No. 131,663
Int. Cl. F16l *39/02*; F17d *1/04*
U.S. Cl. 137—357 **6 Claims**

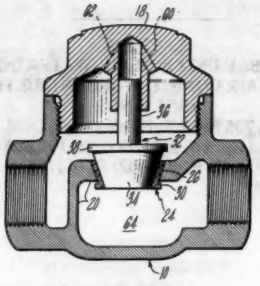


A unit for conducting air and water in an induction system of air conditioning in a multi-story building comprising a modular assembly of water pipes and an air duct stationarily enclosed within a housing and heat insulated from each other and the walls of the housing with projecting terminal end portions on opposite ends of the pipes and duct provided with couplings for connecting adjacent terminal end portions of the water pipes and air ducts of adjacent units after the units are in longitudinal alignment. A support on each unit or module is adapted to support each unit on one floor of each adjacent pair of stories in the building in said longitudinal alignment in position for effecting the coupling between the pipes and air ducts of adjacent units while so supported, and each unit is provided with air and water take-offs for connecting with an induction unit in the space between the floors of each adjacent pair of stories. The projecting terminal end portions of the pipes and air ducts are preferably not threaded and the couplings therefor are longitudinally extensible elements, with the coupling for the air ducts secured on one terminal end portion of each unit for said extension to connect with the duct on the adjacent unit or module.

3,677,286
VALVE
Joseph Wolfson, Rocky Hill, Conn., assignor to Bloomfield Valve Corporation, Bloomfield, Conn.
Division of Ser. No. 837,769, June 30, 1969, Pat. No. 3,598,145. This application Nov. 25, 1970, Ser. No. 92,570The portion of the term of this patent subsequent to Aug. 10, 1988, has been disclaimed.
Int. Cl. F16k *15/06*
U.S. Cl. 137—469 **1 Claim**

A valve having a disc member which cooperates with the valve seat to perform the valving action, the disc member being characterized by a sail which will be acted upon by fluid in the system to cause rapid and full opening and closing of the

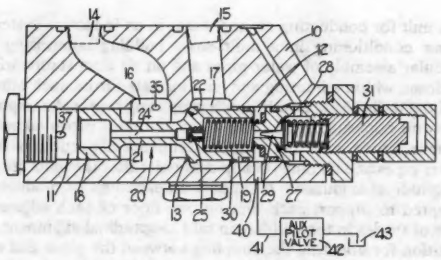
valve regardless of the position thereof. The seat and disc members respectively have a complementary frustoconical aperture and a plug portion and the sail is spaced from the seat with the valve in the closed condition.



3,677,287
RELIEF VALVE

John Morris, Halsall, Nr. Ormskirk, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 9, 1970, Ser. No. 96,523
Claims priority, application Great Britain, Dec. 9, 1969, 59,937/69
Int. Cl. F16k *31/12*
U.S. Cl. 137—491 7 Claims



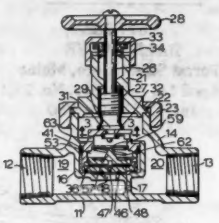
A relief valve for a reversible delivery pu.np includes a bore having two portions of different diameters and a pair of ports opening into the bore on either side of a valve seat located between the two portions. A spool is slidable in the bore to engage the seat and includes two piston parts engaged in the respective portions of the bore. A selector valve allows the smaller of the pistons to communicate with whichever of the ports is at the higher pressure. Opposite ends of the spool intercommunicate via restricted orifice, the flow through the orifice being regulated by pilot valve responsive to the higher pressure.

3,677,288
FLOW CONTROL VALVE

Thomas B. Martin, Micro-Pump Corporation, 1021 Shary Court, Danville, Calif.

Filed Oct. 8, 1970, Ser. No. 79,085
Int. Cl. F16k *31/36*
U.S. Cl. 137—501 9 Claims

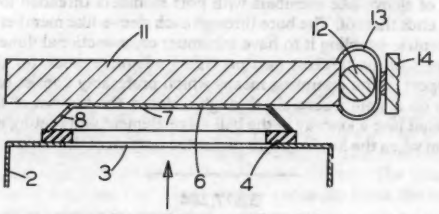
A structure is provided for use in a globe valve or the like in installations where constant flow is desired despite variations in inlet and outlet pressures. The valve stem is attached to the structure and movement of the stem determines the effective maximum flow through the valve. Inlet and outlet pressures operate upon opposite sides of a diaphragm, and the differential in pressure causes movement of a valve member relative to an orifice and thereby maintains constant flow through said orifice.



3,677,289
PRESSURE RELIEF VALVE

Richard D. Rivers; Thomas W. Byers, and Edward J. Fortener, all of Louisville, Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed Sept. 9, 1970, Ser. No. 70,704
Int. Cl. F16k *15/03*
U.S. Cl. 137—527.8 3 Claims

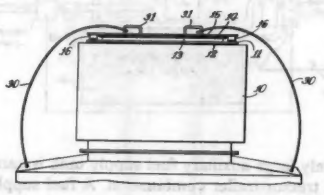


A pressure relief valve assembly for a plenum chamber including a ported valve seat communicating with an outlet of the chamber and a weighted relief valve cooperating with the ported valve seat, the extreme edge of the valve engaging in sharp-line contact with the ported valve seat.

3,677,290
PRESSURE VENTING ASSEMBLY

Frederick Adolph Giesecke, Riverside, Ill., assignor to CPC International Inc.

Filed Sept. 24, 1970, Ser. No. 75,152
Int. Cl. F16k *17/02, 31/08*
U.S. Cl. 137—528 2 Claims



This invention discloses a pressure venting assembly for an enclosure comprising, in combination, (a) a flange around the periphery of an opening in said enclosure having a raised in-

ward portion; (b) a compressible gasket disposed on the raised portion of the flange and extending around the opening; (c) a plurality of magnets spaced around the opening and adjustably mounted on the flange relative to the height of the raised portion of the flange; and (d) a cover plate for the opening, of magnetically susceptible material, capable of resting on the gasket and engaging the magnets.

3,677,291

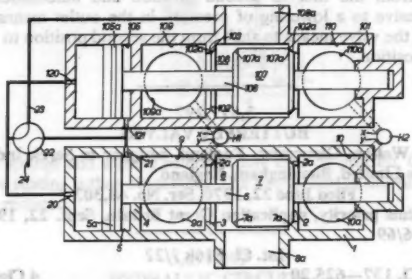
CHANGE-OVER VALVES

Peter Laws, 16 Steele's Road, London, N.W. 5, England

Continuation-in-part of Ser. No. 687,954, Nov. 15, 1967, abandoned. This application Sept. 28, 1970, Ser. No. 76,192

Int. Cl. F16k *37/00*

U.S. Cl. 137—554 6 Claims



The invention provides a fluid flow path or source selector valve, comprising a valve body defining a valve chamber with a main port a pair of subsidiary ports and a valve seat internally of the chamber for each subsidiary port, valve means mounted in the chamber for movement across the chamber between the valve seats and defining a pair of valve faces each adapted for sealing engagement with one of said valve seats, and fluid pressure operated actuating means for effecting movement of the valve means across the valve chamber to selectively seal off one or other of said subsidiary ports.

3,677,292

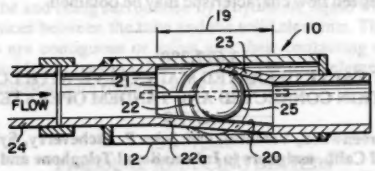
PIPELINE FLOW TEE

Howard F. Bell, and John A. Scheineman, both of Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,544

Int. Cl. F16l *41/00*

U.S. Cl. 137—544 2 Claims



A method and apparatus for passing a pipeline sphere through a flow tee disposed in a pipeline whereby fluid flowing through the pipeline may selectively be flowed through at least one of the outlets of the run of the flow tee or the branch outlet of the flow tee while preventing the sphere from entering the branch outlet. A gap is formed in the run of the flow tee at its junction with the branch outlet so that fluid may pass through either the run or the branch outlet when the run is occupied by a pipeline sphere. This gap is approximately equal to between 1½ and 2 times the diameter of the sphere.

3,677,293

FLUID FLOW CONTROL SYSTEMS

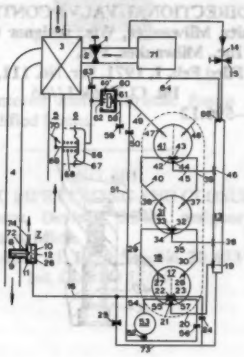
Owen D. Furlong; Alan C. Rowe, and Eric F. Wright, all of Yeovil, Somerset, England, assignors to Westland Aircraft Limited, Yeovil, Somerset, England

Filed Feb. 10, 1966, Ser. No. 526,597

Claims priority, application Great Britain, April 2, 1965, 14,078/65

Int. Cl. F15c *1/04*

U.S. Cl. 137—561 9 Claims



A fluid flow control system for controlling conditions of flow in first and second ducts. A signal representing a condition in one duct is supplied to a fluid amplifying device, the output of which operates a control apparatus to vary the operating conditions, preferably in another fluid flow duct.

3,677,294

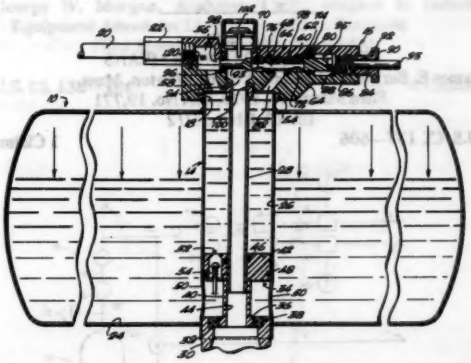
HYDRAULIC FLUSH TANK

James W. Gibbs, and John L. Gibbs, both of Hialeah, Fla., assignors to Marine Bank and Trust Company

Filed April 12, 1971, Ser. No. 133,242

Int. Cl. E03d *3/04*

U.S. Cl. 137—572 13 Claims



A hydraulic assembly for filling and rapidly discharging a liquid from a hermetically sealed tank. The assembly includes a flush tank having a cylindrical sleeve extending vertically therethrough and a tubular axially disposed air vent within the sleeve. A valve means, slidably disposed within the sleeve on the tubular air vent adjacent the lower end thereof, is closed by the normal water line pressure, entering through the top of

the sleeve, to hermetically seal the flush tank and the chamber within the sleeve, permitting the pressure therein to build until it balances the water line pressure. Manually operated valve means are provided at the top of the sleeve to open the pressurized chamber within the sleeve to the air vent causing the rapid discharge through the air vent of part of the water within the sleeve chamber, which, because of the pressure differential thus created, opens the valve at the bottom of the sleeve causing a rapid discharge of the pressurized water from the tank.

3,677,295

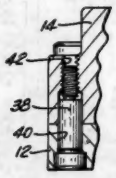
DIRECTIONAL VALVE CONTROL

John R. Schultz, Milwaukee, Wis., assignor to Applied Power Industries, Inc., Milwaukee, Wis.

Filed Feb. 1, 1971, Ser. No. 111,276

Int. Cl. F16k *11/06*

U.S. Cl. 137—596.12 **2 Claims**



A directional control valve having a valve body with four ports equally spaced around a common axis, a wide land seal assembly in diametrically opposite ports and a movable valve disc mounted for rotary motion on one face of the valve body, the valve disc includes a pair of passages having openings positioned to engage the ports, check valves are provided in each of the passages to limit fluid flow to one direction through the passages, and a central passage for bypassing fluid through the valve body. The wide land seal assemblies each include a metal seal disc having a tapered flange on one side and a resilient sleeve bonded to the flange to seal the assembly in the port and to bias the metallic disc against the valve disc.

ERRATUM

For Class 137—596.16 see:
Patent No. 3,677,826

3,677,296

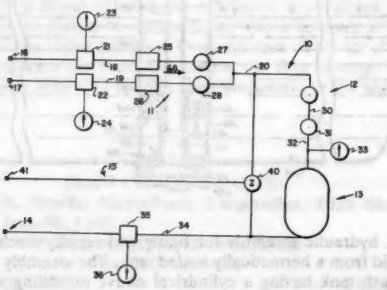
FLUID PROPORTIONER MEANS

James E. Berger, 124 Second Avenue, Newton, Mass.

Filed March 16, 1970, Ser. No. 19,771

Int. Cl. F16k *31/12*

U.S. Cl. 137—606 **1 Claim**



A fluid proportioning system for obtaining desired mixtures of fluids has at least two fluid inlet conduits with each of said conduits carrying a flow meter and flow control means. A common conduit interconnects the inlet conduits and leads to an automatic fluid supply control valve means for permitting passage of fluid in the common conduit at a predetermined pressure and cutting off fluid flow at a second predetermined pressure. A surge tank is interconnected with the automatic fluid supply control valve means for receiving fluid from the common conduit and an output conduit delivers fluid from the surge tank. Preferably the automatic supply control valve means is a mechanically operated pressure valve circuit which has an inlet means for admitting fluid flow and an outlet means for delivering fluid from the inlet means. Valve means permits fluid flow from the inlet means to the outlet means in a first position of the valve means and cuts off fluid flow from the inlet to the outlet means in a second position. A fluid pressure sensitive means controls the valve means to make it automatically responsive to a buildup in pressure at the outlet means to shift from the first to second position and automatically responsive to a lowering of pressure in the outlet means to cause the valve means to shift from the second position to the first position.

3,677,297

BUTTERFLY VALVES

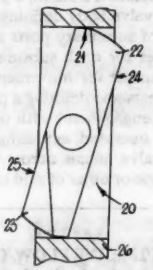
Peter Walton, Gloucester, England, assignor to Serck Industries Limited, Birmingham, England

Filed June 22, 1970, Ser. No. 48,303

Claims priority, application Great Britain, Sept. 22, 1969, 46,486/69

Int. Cl. F16k *1/22*

U.S. Cl. 137—625.28 **4 Claims**



A butterfly valve has a vane in the form of a disc with part-spherical periphery. The periphery engages the valve housing to shut the valve. Portions of the vane are removed so that as the valve is opened the whole of the fluid flow passes over the relieved portion. By selection of the shape of the relieved portions a desired flow characteristic may be obtained.

3,677,298

PILOT VALVE OPERATED MAIN VALVE WITH LOST MOTION CONNECTED AND TANDEM OPERATED VALVES

Roger Greenwood, Valencia, and John P. Etcheverry, Sylmar, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

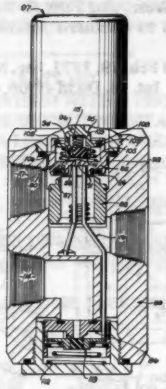
Filed Dec. 24, 1970, Ser. No. 101,330

Int. Cl. F16k *11/02*

U.S. Cl. 137—625.64 **8 Claims**

A solenoid actuated three-way valve to admit air under pressure to a spring biased piston in a cylinder and, alternatively, to exhaust the cylinder to the atmosphere. Two pilot valves are operated substantially in tandem. The operator has a lost motion connection with the valves for positive valve actuation in the event of pressure failure. A framework between one main valve and one pilot valve for the other main valve causes the one pilot valve to close when the one main valve

opens, and vice versa. Both main valves are oriented so that fluid pressure biases them in a closing direction. Small closing



bias springs and a small solenoid may thus be utilized. Good valve seating is thus obtainable. The overall size of the valve is also reduced.

3,677,299

HYDRAULIC CIRCUITS

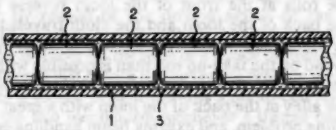
Pierre Cibie, Paris, France, assignor to Projecteurs Cibie

Filed July 31, 1970, Ser. No. 59,878

Claims priority, application France, Aug. 5, 1969, 6926812

Int. Cl. F16l *55/04*; E03b *7/10*

U.S. Cl. 138—26 **8 Claims**



A hydraulic control circuit particularly for use in motor vehicles for the orientation of headlamps in which there is a flexible tube enclosing a transmission medium whereof the volumetric coefficient of expansion is equal to three times the linear expansion of the tube. This transmission medium consists of a number of solid elements located end-to-end within the tube and being surrounded by a hydraulic liquid which fills the spaces between the tube and the solid elements. These elements are contiguous or joints and their contacting surfaces are rounded to permit relative rolling. The solid elements may be cylindrical with rounded ends or spheres.

3,677,300

PRESSURE REDUCING DEVICES

Colin F. King, Erdington, England, assignor to Dunlop Holdings Limited, London, England

Filed July 8, 1970, Ser. No. 53,162

Claims priority, application Great Britain, Jan. 15, 1970, 2,001/70

Int. Cl. F15d *1/02*

U.S. Cl. 138—42 **16 Claims**

A pressure reducing device comprises an inlet for high pressure gas, an outlet for low pressure gas and a path therebetween for flow of gas from inlet to outlet. The path includes at least one porous baffle having a relatively coarse pore inner portion disposed in an inner zone of said path and a relatively fine pore outer portion in an outer zone of said path. Porous materials that may be used include layers of gauze, ex-

panded metal, sintered metal, ceramic foams and plastics foams such as rigidified foams.

3,677,301

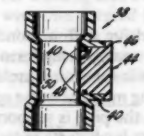
PLASTIC PIPE FITTING AND CLOSURE

Robert M. Williams, Davison, Mich., assignor to Genova Products, Davidson, Mich.

Filed April 21, 1970, Ser. No. 30,433

Int. Cl. F16l *55/10*

U.S. Cl. 138—92 **2 Claims**



A cleanout for a plastic pipe system which includes a threadless socket and a threadless plug fitted in sealing relation in said socket and interconnected to prevent internal forces from displacing the plug. The socket and plug can be utilized in a pipe system for other purposes than that of a cleanout.

3,677,302

BI-AXIAL ARTICULATING PIPELINE STRUCTURE

George W. Morgan, Anaheim, Calif., assignor to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed March 9, 1970, Ser. No. 17,649

Int. Cl. F16s *7/00*

U.S. Cl. 138—106 **6 Claims**

A riser is disclosed wherein a plurality of substantially rigid pipes are enclosed within a larger outer pipe. The outer pipe is divided into rigid sections that are hinged together to allow the

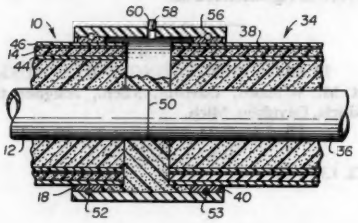
riser to bend on a bending axis normal to the riser axis. Alternate bending axes are disposed normal to the interstitial bending axes. The larger of the enclosed pipes are disposed along the diameter that coincides with the bending axes whereby the pipes form a helical twist of 90° to the next hinged-connection. The other enclosed pipes are layed spaced from and near to these larger pipes also in a helically twisting fashion thereby preserving their individual flexibility.

3,677,303

PREFABRICATED CONDUIT

Joseph L. Martin, Windsor, England, assignor to Anvil Industries, Inc., Brecksville, Ohio

Continuation-in-part of Ser. No. 541,233, April 8, 1966. This application April 14, 1969, Ser. No. 826,751
Int. Cl. F16l 9/14
U.S. Cl. 138—109 **2 Claims**



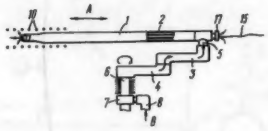
A conduit comprising a fluid conducting pipe supported within a casing, the casing being formed by a pair of coaxial, radially spaced plastic tubes and including corrugated structure and an insulating material in the space between the tubes. In one embodiment the pipe is supported within the casing in spaced relation to its inner surface by pipe supports disposed along the pipe to provide an insulating air space around the pipe, and in another embodiment the casing is filled with a foamed resin around the pipe. Sections of the conduit may be connected together by a tubular sheath surrounding and extending between the ends of adjacent casing sections and structure including O-rings mounted between the ends of the sheath and the casing sections.

3,677,304

PNEUMATIC RAPIER FOR INSERTING WEFT THREAD INTO WARP SHEDS

Nikolai Ivanovich Makachev, ulitsa Tsjurupy, 12, korpus 1, kv. 27, and Alexei Nikolaevich Parshin, Nagornaya ulitsa, 34, korpus 43, kv. 53, both of Moscow, U.S.S.R.

Filed June 10, 1970, Ser. No. 45,003
Claims priority, application U.S.S.R., Aug. 4, 1969, 1341950; July 18, 1969, 1339167
Int. Cl. D03d 47/30
U.S. Cl. 139—127 P **2 Claims**



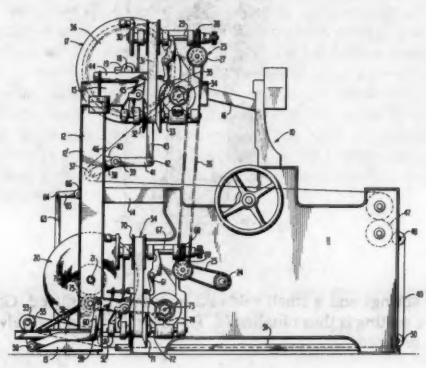
A rapier for inserting a weft thread into a warp shed, in which a tube is located in a casing, with one end of the tube being connected to an attachment for generating therein a pressure flow, and the other end projecting from the casing, with its butt being sheared at an acute angle so that the far end of the shear is the closest to the reed, and the near end the closest to the fabric fell.

3,677,305

LOOM HAVING INTERCONNECTED WARP LET-OFF AND CLOTH TAKE-UP MEANS AT BACK OF LOOM

Arch E. Cutting; Carlos L. Owens, both of Greenville; Dewey H. Williams, Greer, and Felix E. Hooper, Greenville, all of S.C., assignors to Southern Machinery Company, Greer, S.C.

Filed Feb. 19, 1971, Ser. No. 116,940
Int. Cl. D03d 49/06, 49/20
U.S. Cl. 139—99 **5 Claims**



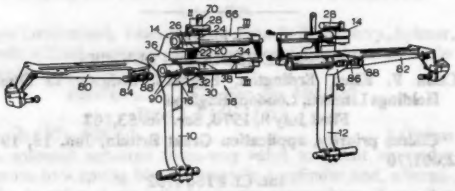
A conventional weaving loom is equipped with a back frame which supports the warp beam in an elevated position and supports the cloth take-up roll in the position normally occupied by the warp beam. A first overhead variable speed drive or let-off controls the feeding of warps to the loom at constant speed and under a constant tension. A second substantially identical variable speed drive at a lower elevation interconnected with the first drive causes controlled winding up of cloth on the take-up roll at constant speed and under constant tension. Two guide rolls at the front of the loom reverse the cloth toward the back of the loom and the cloth travels through a protective tunnel near floor level. Up to five times more cloth can be wound on the take-up roll than is possible with conventional arrangements. The warp beams and cloth rolls are handled in one alley at the back of the loom with a great lessening of the doffing problem, and existing beam handling equipment may be utilized.

3,677,306

LOOM SLEYS

Cyril Millward Atkinson, Silverdale, Carnforth, England, assignor to Northrop Weaving Machinery Limited, Daisyfield, Blackburn, Lancashire, England

Filed Oct. 1, 1969, Ser. No. 862,870
Int. Cl. D03d 49/60
U.S. Cl. 139—188 **4 Claims**



A loom sley capable of use in high speed looms comprises a substantially tubular member, said tubular member having attached thereto a race board plate and a reed support device, said race board plate and said reed support device being either

permanently or detachably secured by welding or by screw means respectively, said reed support device comprising a reed support and a reed cap carrier, said reed cap carrier also being made as a tubular member and being supported at or near its ends, said reed cap carrier also being rotatable. The sley extends outside each sley sword to carry shuttle boxes.

3,677,307

ARRANGEMENT PROVIDED WITH A PHOTO-CELL AND CONTROLLING THE DETECTING MEANS AND THE STOP MOTION IN A LOOM UPON BREAKING OF A THREAD IN THE WARPING, WEAVING AND KNITTING SYSTEMS

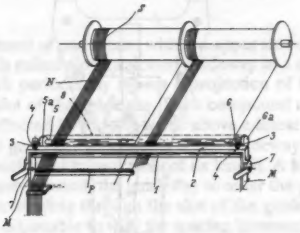
Georges P. Florucci, 69, Avenue de l'Hippodrome, 6 La Tour de Salvagny, France

Filed June 22, 1970, Ser. No. 48,278

Claims priority, application France, June 27, 1969, 6921900

Int. Cl. D03d *51/20*; D02h *13/04*; D04b *35/16*

U.S. Cl. 139—353 6 Claims



In a loom or warping system, a safety arrangement is provided for operating machine-stopping or detecting means whenever a thread breaks. To this end, the sheet of parallel threads is constrained to pass over a braking member, in practice between frictionally acting parallel transverse bars, so that upon breaking of a thread beyond the braking member, said thread may continue progressing to the rear of and towards the latter by reason of the driving action of the adjacent threads. The broken thread gathers thus into a ball adjacent the braking member on the path of a pencil of light grazing the sheet of threads just before it reaches the braking member and sent out by a source of light towards a photo-cell releasing an alarm or the like mechanism whenever a thread breaks. The source of light and photo-cell are advantageoulsy rigid with the braking member so as to make the operation independent of the vibrations of the loom, warping system or the like machine.

3,677,308

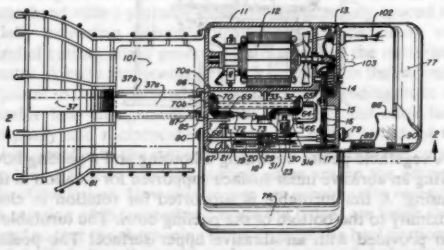
POWER-DRIVEN WIRE TYING MECHANISM

Forest M. Sarff, P.O. Box 419, Newhall, Calif., and Silas B. Birch, Jr., 9284 Dorrington Place, Arleta, Calif.

Filed Nov. 20, 1970, Ser. No. 91,267

Int. Cl. B21f *9/02*, *15/04*

U.S. Cl. 140—93.6 1 Claim



This invention relates to wire tying mechanisms, and more particularly to a power-driven mechanism for making wire ties for the purpose of bundling materials, tying the tops of sacked material, tying reinforcing steel together prior to placing concrete in reinforced concrete structures, for tying together such assemblies as garden stakes, fencing and similar packages or assemblies, or any assembly, the parts of which can be secured together by wire ties.

3,677,309

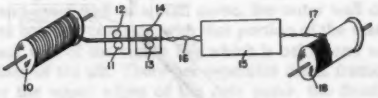
WIRE FORMING APPARATUS

Andrew J. Grandy, 2707 Grant Avenue, North Hills, Pa.

Division of Ser. No. 823,232, March 28, 1969, Pat. No. 3,566,504, which is a division of Ser. No. 180,058, March 15, 1962, Pat. No. 3,470,861. This application June 24, 1970, Ser. No. 49,484

Int. Cl. B21f *7/00*

U.S. Cl. 140—149 2 Claims



Apparatus for forming a wire for use in a wire gun in which pairs of rollers are provided to twist the wire in its soft condition beyond its elastic limit prior to heat treating and stress relieving the wire. Additional pairs of rollers are provided to reverse the twist in the wire below the elastic limit of the wire to a flat wire condition for winding into a coil upon a reel having a locking slot. The wire thus formed is subjected to but a single stress below the elastic limit of the wire and the tendency of the wire to fracture is eliminated. The wire has the capacity to store a maximum of torsional energy.

3,677,310

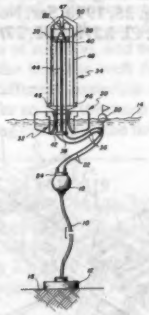
METHOD FOR CONNECTION OF AN UNDERWATER RISER TO A FLOATING FACILITY

Christian D. Dobler, Riverside, and Herbert J. Lilly, Jr., Mission Viejo, both of Calif., assignors to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed July 9, 1970, Ser. No. 53,363

Int. Cl. B65b *1/04*, *3/04*

U.S. Cl. 141—1 9 Claims



This specification discloses a method and apparatus for connecting a flowline of a well or satellite system which is located at a substantial distance beneath the surface of a body of water. A flowline, which is known as a riser, is provided at a well head or riser manifold. At the upper free end, off the flowline, there is a riser buoy which is releasably attached to a tanker during flowing operations and disconnectable during storms or otherwise violent sea conditions. In the disconnected mode, the riser remains submerged under the ocean surface to avoid excess structural loading. The riser is sup-

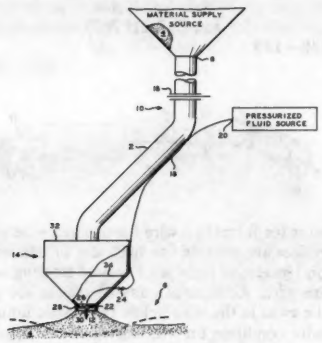
ported by means of a float to maintain tension within acceptable stress limits throughout a wide range of changes in vertical and some horizontal movements when the riser is disengaged from the tanker.

3,677,311

MATERIAL MOVING APPARATUS AND METHOD

Russell C. Parrish, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Feb. 8, 1971, Ser. No. 113,305
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—1 **10 Claims**



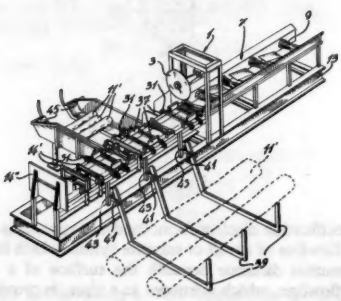
A first end of a delivery conduit is in communication with a supply source which extends generally downwardly therefrom and has a second end positioned above a second location. A pressurized fluid conduit is positioned within a discharge end of the delivery conduit with said pressurized fluid conduit being directed outwardly therefrom. Means are provided for intermittently discharging pressurized fluid from the pressurized fluid conduit and the delivery conduit for moving material through and from the delivery conduit.

3,677,312

SLASHER FOR CUTTING TREE STEMS INTO LOGS OF SELECTED LENGTH

Jean Paul Tanguay, St. Prime, Quebec, Canada, assignor to Placements Jean Paul Tanguay Limited, Quebec, Canada

Filed Aug. 25, 1970, Ser. No. 66,804
Int. Cl. B27b *5/02, 27/10*
U.S. Cl. 143—46 F **8 Claims**



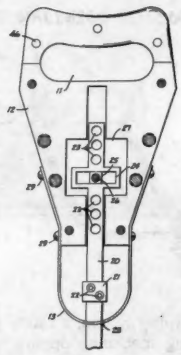
A slasher for cutting tree stems into logs of predetermined selected length by means of a saw located at a cutting station, the stems being moved to cutting position by a first conveyor formed of spaced gripping rollers. A series of retractable arresting plates are provided on the first conveyor, downstream of the station, the plates being selectively movable upwardly to stop the stems to allow their being cut into logs of which the length corresponds to the position, along the conveyor, of the selected arresting plate. An endless conveyor travelling across the first conveyor and provided with upstanding discharge plates pushes the logs laterally off the first conveyor.

3,677,313

POWER HAND SAW

Henry M. Hessler, Indianapolis, Ind., assignor to George J. Pazder, Jr., Greenwood and Alva James Rudkin, Jr., New Whiteland, Ind., part interest to each

Filed Jan. 22, 1970, Ser. No. 4,879
Int. Cl. B27b *19/08*
U.S. Cl. 143—68 F **2 Claims**



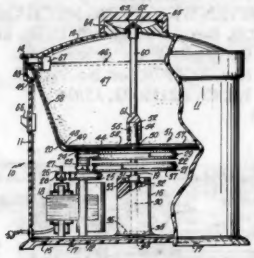
A motor powered hand saw. Power is applied by a motor causing a shaft in the hand saw to rotate. The rotating shaft in conjunction with a slide-channel mechanism results in the reciprocation of a cross shaped member. Attached to the cross shaped member is the saw blade.

3,677,314

AUTOMATIC VEGETABLE PEELER

Salvio Plana, 325 Lindsey Street-Apt. 3, Drummondville, Quebec, Canada

Filed Sept. 8, 1970, Ser. No. 70,440
Int. Cl. A23n *7/00*
U.S. Cl. 146—49 B **7 Claims**

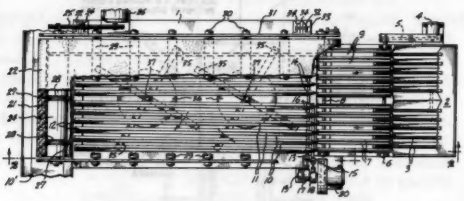


A vegetable peeler comrising a housing and a peeling bowl having an abrasive inner surface supported for rotation in the housing. A flat turntable is supported for rotation in close proximity to the bottom of the peeling bowl. The turntable is also provided with an abrasive upper surface. The peeling bowl and the turntable are both driven in opposite direction to one another.

3,677,315
METHOD FOR TRIMMING PROJECTIONS FROM GLOBULAR ARTICLES

James P. Cox, Burnaby, British Columbia, Canada, assignor to John Inglis Frozen Foods Company, Modesto, Calif.

Division of Ser. No. 707,512, Feb. 21, 1968, Pat. No. 3,538,969. This application July 6, 1970, Ser. No. 52,564
Int. Cl. A23n *15/02*
U.S. Cl. 146—224 6 Claims

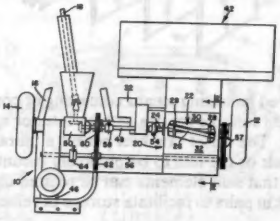


By engagement of pad means with the upper side of a globular article, it is rolled along a slotted guideway in a compound rotation which periodically moves a projection of the article through the slot of the guideway. Such compound rotation in one form is effected by moving a pad above a linear guideway in a direction generally lengthwise of the guideway while the guideway is oscillated transversely of its length. A knife blade is rotated closely beneath the guideway to sever the projection of an article extending through the slot of the guideway. The knife blade is adjustable to vary the spacing between it and the bottom of the guideway to regulate the trimming of the projections.

3,677,316
METHOD AND APPARATUS FOR SHARPENING FORAGE HARVESTER KNIVES

David Rees Markham, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed March 11, 1970, Ser. No. 18,410
Int. Cl. A01d *75/08*
U.S. Cl. 146—242 13 Claims

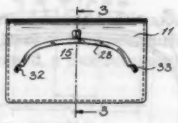


A forage harvester has an axially horizontal cylinder-type cutterhead with a plurality of elongated angularly spaced and axially extending knives at the cutterhead periphery with parallel cutting edges generating a cylinder as the cutterhead rotates. A knife sharpening device is mounted on the harvester adjacent to the cutterhead and includes a sharpening stone adjustable into engagement with the knives at the cutterhead periphery and reciprocatable along the entire length of the knives parallel to the cutterhead axis. In operation the cutterhead is rotated so that the cutting edges are on the advance side of the knives. However, means are provided for reversing the rotation of the cutterhead while the knives are being sharpened so that the sharpening stone engages the heel portion of each knife before the cutting edge, the outward deflection of the sharpening stone due to the engagement with the knives providing a small degree of heel relief on the knives.

3,677,317
LADIES CLUTCH BAG WITH COIN PURSE

Ervin Kery, West Bend, Wis., assignor to Enger Kress Company, West Bend, Wis.

Filed Nov. 12, 1970, Ser. No. 88,630
Int. Cl. A45c *3/00*
U.S. Cl. 150—28 R 9 Claims



A ladies' clutch bag has an inverted U-shaped slit in its back wall providing an opening to receive material which forms the interior and inner wall of a coin purse, the outer wall of the coin purse being in common with that portion of the material of the back wall of the clutch bag which is below and within the confines of the slit. There are separable metal frame elements for the upper edges of the coin purse, the front one being connected to the upper margin of said last-mentioned common material, and the rear one being connected to the margin of a section of material at the inner side of the coin purse which can be flexed away from the wall of the clutch bag.

3,677,318
RADIAL TIRES

Eduard Glass, Wipperauer Str. 45, 565 Solingen-Landwehr, and Heinrich Alker, Aachener Str. 26, 565 Solingen-Ohligs, both of Germany

Filed Sept. 15, 1970, Ser. No. 72,414
Int. Cl. B60c *9/06*
U.S. Cl. 152—356 6 Claims

Radial tires are provided with plies made from a fabric with warp filaments running across the carcass of the tire at right angles to the direction of rotation, and weft filaments running circumferentially of the tire, the weft filaments being made from two or more different materials whose strength and stretch properties differ so that the warp filaments are able to spread uniformly during curving of the tire blank.

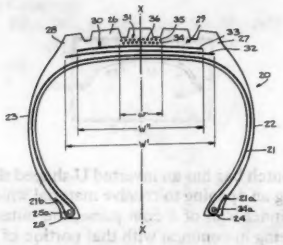
3,677,319
BELTED PNEUMATIC TIRES

Henri Mirtain, Compiegne, France, assignor to Uniroyal Englebert France S.A., Neuilly sur Seine, France

Filed July 23, 1970, Ser. No. 57,705
Claims priority, application France, Aug. 19, 1969, 6928426
Int. Cl. B60c *9/18*
U.S. Cl. 152—361 35 Claims

Belted pneumatic tires characterized by improved tread-reinforcing breaker constructions are disclosed. In any such breaker, a single-section plural-layer non-metallic textile cord ply structure having the cords thereof oriented at a 0° angle to the median equatorial plane of the tire is combined with a plural-layer ply structure of metallic wires or strips which in each layer are crossed relative to those in the other layer and are oriented at a substantial bias angle, preferably between about 18° and 75°, to the said plane. The plural-layer textile cord ply

structure, which may be located radially outwardly or inwardly of the metal ply structure or between the layers thereof, is constituted by a single length of breaker cord fabric wound in a continuous spiral circumferentially of the carcass for at least a plurality of full turns and is considerably narrower than the metal ply structure. Such tires are found to be

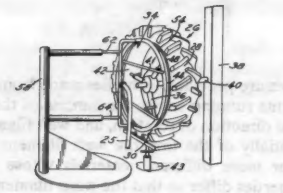


possessed of good road-holding or cornering ability while affording good riding comfort. This abstract is not to be taken either as a complete exposition or as a limitation of the present invention, however, the full nature and extent of the invention being discernible only by reference to and from the entire disclosure.

3,677,320
TIRE BEAD SEATING AND INFLATION APPARATUS AND METHOD FOR USING SAME

Lee M. Corless, Grosse Pointe Woods, Mich., assignor to B & J Manufacturing Company, Glenwood, Ill.

Filed Oct. 12, 1970, Ser. No. 79,876. The portion of the term of this patent subsequent to Jan. 5, 1988, has been disclaimed.
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.1 11 Claims

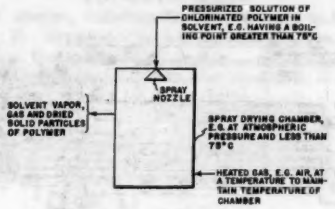


A method and apparatus for bead seating and inflating tubeless tires on a vehicle wheel is provided. The system is particularly adapted for use in connection with large tires such as are used on farm tractors. The apparatus for seating the tire beads comprises an annular tube having orifice means for injection of air under pressure peripherally around the tire through the space between the wheel rim and the tire bead. The inflation apparatus comprises means for connection to the conventional tire valve. Control means are provided for simultaneously injecting air into the tire from the bead seating apparatus and through the conventional tire valve. The control means include means for initially injecting high pressure air for rapid bead seating and inflation. Means are provided to discontinue the flow of high pressure air at a predetermined safe point and to continue to completely inflate the tire by means of low pressure air. The method of the invention relates to the manipulation of the tire and control apparatus during seating and inflation.

3,677,321
SPRAY-DRYING PROCESS

Edward Felstead, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 13, 1970, Ser. No. 2,668
Claims priority, application Great Britain, Jan. 27, 1969, 4,445/69
Int. Cl. B01d *1/16*; C08f *1/88*; F26b *3/12*; C08d *5/06*
U.S. Cl. 159—48 10 Claims

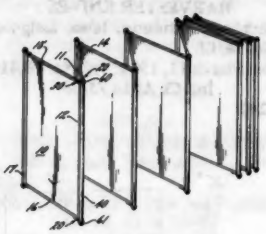

PRESSURIZED SOLUTION OF CHLORINATED POLYMER IN SOLVENT, E.G. HAVING A BOILING POINT GREATER THAN 75°C
SPRAY NOZZLE
SOLVENT VAPOR, GAS AND DRIED SOLID PARTICLES OF POLYMER
SPRAY DRYING CHAMBER, E.G. AT ATMOSPHERIC PRESSURE AND LESS THAN 75°C
HEATED GAS, E.G. AIR, AT A TEMPERATURE TO MAINTAIN TEMPERATURE OF CHAMBER

The spray-drying of solutions of chlorinated polydienes is carried out by atomizing the solution into an evaporation zone maintained at a temperature below 75° C through which gas is flowing.

3,677,322
MOUNTING ARRANGEMENT FOR PIVOTAL SPACE DIVIDER

Donald L. Brorson, Hinsdale, and Raymond A. Magnuson, Western Springs, both of Ill., assignors to Beatrice Food Co., Chicago, Ill.

Filed Sept. 15, 1970, Ser. No. 72,465
Int. Cl. E06b *9/06*
U.S. Cl. 160—135 3 Claims



An improved mounting means consisting of complementary offset brackets suitable for use with an interior space dividing arrangement. The offset brackets permit a plurality of space-dividing panels or the like to be pivotably mounted to a common post so that said elements can be rotated closely parallel to each other in pairs to facilitate storage or relocation.

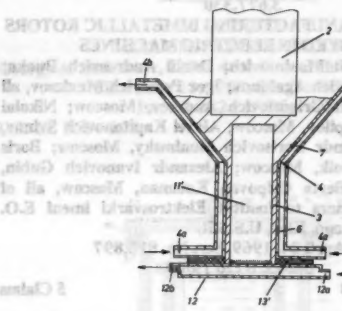
3,677,323
PROCESS AND APPARATUS FOR PROVIDING STEEL INGOT

Manfred Wahlster, Bochum-Stiepel, and Alok Choudhury, Hattingen, both of Germany, assignors to Rheinstahl Huttenwerke A.G., Essen, Germany

Filed Nov. 17, 1969, Ser. No. 877,371
Claims priority, application Germany, Nov. 22, 1968, P 18 10 371.4
Int. Cl. B22d *27/02*
U.S. Cl. 164—52 1 Claim

A process for the production of a steel ingot of small cross sections comprises forming the ingot within the lower end of a mold which has a head portion which widens out in a conical configuration at its upper end and which carries in its conical

portion a slag bath. A consuming electrode is dipped into the slag bath and it melts down in drops due to the passage of current and solidifies in the continuous casting mold at the top of the ingot. The electrode is moved at a speed such that it approaches the mold at a speed to remain immersed with its full cross section in the slag and so that the solid as well as the liquid parts of the ingot are present only in the lower part of



the mold. The apparatus for carrying out this process includes a mold having a lower end of uniform cross section and an upper outwardly flaring conical end. The walls of the conical portion have an opening angle of between 60° and 120° and preferably 90° and this is sufficient to contain a slag bath to permit the electrode of a larger diameter than the ingot to be lowered into the bath with its full cross section.

3,677,324

METHOD AND APPARATUS FOR PRODUCING A METAL ARTICLE

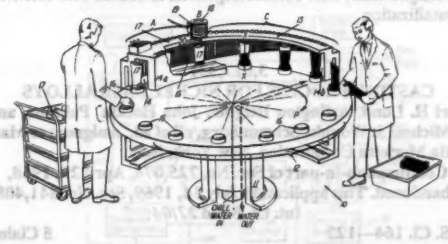
Gordon John Spencer Higginbotham, Derby, and Douglas Wilson Hall, Brailsford, both of England, assignors to Rolls-Royce Limited, Derby, Derbyshire, England

Filed July 9, 1970, Ser. No. 53,514

Claims priority, application Great Britain, July 11, 1969, 35,121/69

Int. Cl. B22d *25/06*

U.S. Cl. 164—60 **10 Claims**



A method of producing a metal article having a unidirectional grain structure in a given direction comprises the steps of heating a mould for the article to a temperature above the melting point of the metal, charging molten metal into, or melting metal in, the mould, effecting relative movement between the mould and a furnace so that said mould moves through the furnace, said furnace having a heat front which is so disposed with respect to the direction of relative movement between the mould and the furnace, so that said heat front moves substantially perpendicular to said direction towards one end of the mould, and cooling the opposite end of said mould so that said heat front produces said grain structure in the article. There is also disclosed an apparatus for carrying out the method.

3,677,325

PROCESS OF SUBMERGED NOZZLE CONTINUOUS CASTING USING A BASALT FLUX

George Wesley Austin, Nechells, England, assignor to Foseco International Limited, Birmingham, England

Filed Sept. 28, 1970, Ser. No. 76,264

Claims priority, application Great Britain, Oct. 10, 1969, 49,929/69

Int. Cl. B22d *11/10*

U.S. Cl. 164—73 **8 Claims**

A process of submerged nozzle continuous casting wherein there is used, as a flux layer on the upper surface of the molten metal in the casting mould, a flux composition including the mineral basalt.

ERRATA

For Classes 164—108 thru 164—154 see:
Patent Nos. 3,677,330 thru 3,677,333

3,677,326

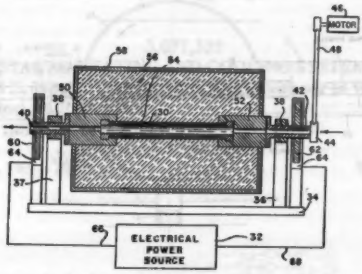
METHOD OF REDUCING REACTION BETWEEN ADJACENT LAYERS OF LIQUID SUBSTANCES HAVING DIFFERENT DENSITIES

Aristid V. Grosse, Haverford, Pa., assignor to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 686,924, Nov. 30, 1967, Pat. No. 3,536,818. This application May 21, 1970, Ser. No. 39,218

Int. Cl. F27b *7/08*

U.S. Cl. 165—1 **6 Claims**



A hollow pipe whose walls are formed of concentric cylinders of different substances may serve as a container for or as a furnace generating high temperatures on the order of 3,000° K. The substances of each cylinder which may be solid at start up are chosen to have liquid densities so that when the substances melt and the pipe is rotated to rim the substances, the layers maintain their desired relationships. One of the cylindrical layers may include uranium disposed so as to support a neutron chain reaction. Other cylindrical layers are provided to protect the uranium against loss due to vaporization and reaction with elements passing through the pipe and to support the uranium layer even when a liquid. Practical applications of the high temperature apparatus include rocketry, MHD generation, and generally any process requiring high temperatures.

3,677,327

METHOD FOR THE RECOVERY OF HEAT FROM HOT GRANULAR MATERIAL

Osmo O. Vartiainen, Kokkola, Finland, assignor to Outokumpu Oy, Toolonkatu, Helsinki, Finland

Filed June 24, 1969, Ser. No. 843,899

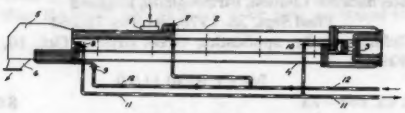
Claims priority, application Finland, June 26, 1968, 1807/68

Int. Cl. F24h *3/02*

U.S. Cl. 165—1 **3 Claims**

This invention relates to a method and to a device for recovery of heat from hot granular or fragmentary material

during its transportation on a conveyor the heat being transmitted by conduction or radiation to a cooling medium flowing in channels built in a track having at least one cooling surface with which at least the conveyor is in contact during the transportation and which track preferably surrounds the conveyor and the granular material to be cooled.

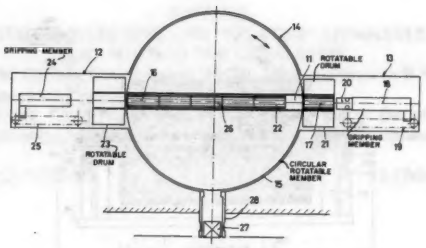


3,677,328

APPARATUS FOR CHARGING AND DISCHARGING FUEL ELEMENTS IN A VERTICAL-CHANNEL NUCLEAR REACTOR

Umberto Buzzi, Laveno; Jacques Pierre Dufresne, Varese, and Flaviano Farfaletti-Casali, Milan, all of Italy, assignors to European Atomic Energy Community (Euratom), European Center Kirchberg, Luxembourg

Filed Jan. 28, 1970, Ser. No. 6,532
Claims priority, application Italy, Feb. 5, 1969, 34745 A/69
Int. Cl. G21c *19/20*
U.S. Cl. 165—47 **7 Claims**



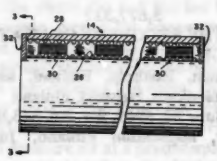
Apparatus for use in manipulation of fuel elements for a vertical channel nuclear reactor comprises a receptacle for a column of elements which is vertical for charging and discharging of the reactor but is turned into a horizontal position for replacement of one or more of the elements.

3,677,329

ANNULAR HEAT PIPE

Milton E. Kirkpatrick, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 797,725, Jan. 31, 1969, Continuation-in-part of Ser. No. 637,193, May 9, 1967, abandoned. This application Nov. 16, 1970, Ser. No. 89,705
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 **7 Claims**



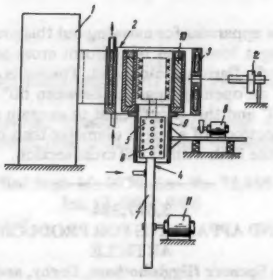
Spaced inner and outer tubes form a closed annular chamber whose inner surfaces contain coverings of wick material that are interconnected through vane-like wicks. The wick material transports a vaporizable working fluid from cold areas where the vapor condenses to warm areas where the fluid vaporizes. An isothermal working space is produced within the central volume bounded by the inner tube and along its entire length, which may be used to advantage for oven or furnace applications or for providing an isothermal jacket.

3,677,330

METHOD OF MANUFACTURING BIMETALLIC ROTORS EMPLOYED IN ELECTRIC MACHINES

Boleslav Ivanovich Maximovich; Daniil Andreevich Duoko; Nikolai Georgievich Agafonov; Igor Petrovich Maximov, all of Kiev; Vadim Grigorievich Andreev, Moscow; Nikolai Yakovlevich Lepilov, Moscow; Alexei Kapitonovich Svinov, Moscow; Alexandr Borisovich Slonimsky, Moscow; Boris Zakharovich Volk, Moscow; Alexandr Ivanovich Gubin, Moscow, and Berta Osipovna Katsman, Moscow, all of U.S.S.R., assignors to Institut Elektrosvarki imeni E.O. Patona ul. Gorkogo, Kiev, U.S.S.R.

Filed April 24, 1969, Ser. No. 818,897
Int. Cl. B22d *19/00*
U.S. Cl. 164—108 **5 Claims**



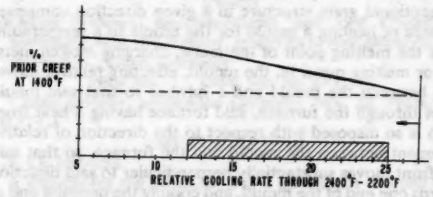
A bimetallic rotor is manufactured by incorporating in a mold magnetically conducting metal members separated by spaces and filling the spaces in the mold with a magnetically non-conducting metal. The mold is then heated to a temperature to melt the magnetically non-conducting metal over a period of time for a complete diffusion of the metals. Thereafter the metals are cooled to a temperature at which the magnetically non-conducting metal solidifies with oriented crystallization.

3,677,331

CASTING PROCESS FOR NICKEL BASE ALLOYS

Carl H. Lund, Arlington Heights; John Hockin, Palatine, and Michael J. Woulds, Schaumburg, all of Ill., assignors to Martin Marietta Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 725,074, April 29, 1968, abandoned. This application July 14, 1969, Ser. No. 841,408
Int. Cl. B22d *27/04*
U.S. Cl. 164—122 **5 Claims**



A casting process and castings produced thereby wherein a nickel-base, chrominum containing alloy which also contains

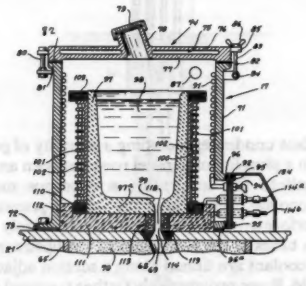
sufficient amounts of aluminum and titanium to produce eutectic gamma-prime phase in the alloy as cast is caused to contain about 0.5 percent to about 5 percent hafnium, is cast into final configuration and is cooled from the molten state rapidly through the range of 2,200° to 1,850° F. to maximize creep characteristics at 1,800° F. while at the same time providing castings which are thermally conditioned to exhibit good mechanical characteristics, especially prior creep at 1,400° F.

3,677,332

VACUUM CASTING PROCESS

George A. Smiernow, 825 S. 48th Street, Philadelphia, Pa.

Filed June 13, 1969, Ser. No. 832,896
Int. Cl. B22d *35/00, 37/00*
U.S. Cl. 164—133 2 Claims



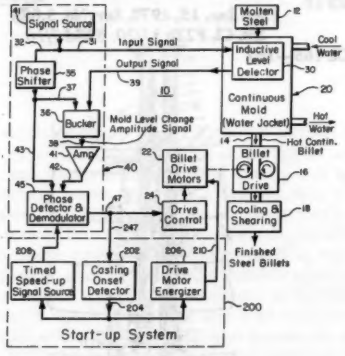
The disclosure relates to a process and apparatus for casting metals by controlling the relative pressure of the space above the molten metal body to be cast with respect to the pressure within the interior of the mold. Numerous features of the mechanism are shown and described.

3,677,333

START-UP SYSTEM FOR CONTINUOUS CASTING MOLD

Jack R. Crowell, Cedar Lake, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 26, 1970, Ser. No. 5,833
Int. Cl. B22d *17/32, 11/08*
U.S. Cl. 164—154 9 Claims



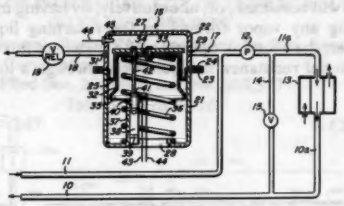
A start-up system for a continuous casting mold level control system which uses the control signal to detect the onset of casting and in response thereto, energizes the drive motors and alters, for an initial predetermined short period, the control signal fed to the drive motor controls to speed up the withdrawal of continuous billet for that period. Thereafter it automatically restores the control system to normal operation.

3,677,334

REMOTE ACCUMULATOR CHARGE INDICATOR

Pritam S. Bathia, and Carl E. Simmons, both of Dayton, Ohio, assignors to United Aircraft Products, Inc., Dayton, Ohio

Filed Dec. 30, 1970, Ser. No. 102,777
Int. Cl. F28f
U.S. Cl. 165—11 7 Claims



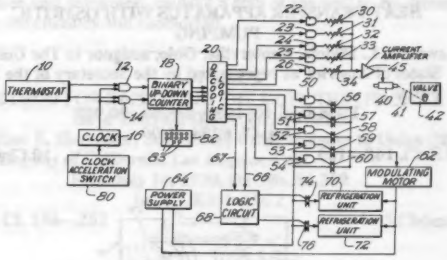
An accumulator-reservoir device, used in a system circulating a liquid coolant or the like, in which a biased pressure applying member moves to reflect changing temperature induced density of the coolant. A remote indicator signals that the system has attained a properly charged condition, or that it has failed to remain fully charged. Electrical controls including variable resistors responding to changes in system temperature and to movement of the piston comprise a triggering circuit. Other controls including a signaling means and a gated Silicon Controlled Rectifier comprise a signaling circuit activated and deactivated by the triggering circuit.

3,677,335

STAGED HEATING AND COOLING SYSTEM

Richard N. Weatherston, St. Paul, Minn., assignor to Weather-Rite Inc., St. Paul, Minn.

Filed Jan. 28, 1971, Ser. No. 110,526
Int. Cl. F25b *29/00*
U.S. Cl. 165—12 8 Claims



A control system for a heating and cooling system in which the amount of heating and the amount of cooling are both controlled in timed incremental stages by means of a signal from an up-down electronic counter which operates to call for the next successive stage at timed intervals in accordance with an electronic clock.

3,677,336

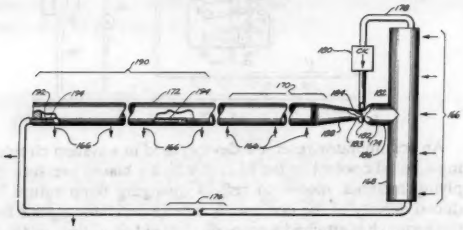
HEAT LINK, A HEAT TRANSFER DEVICE WITH ISOLATED FLUID FLOW PATHS

Robert David Moore, Jr., 817 W. Camino Real, Arcadia, Calif.

Filed July 6, 1970, Ser. No. 52,642
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 8 Claims

A heat transfer device, defined here as a heat link, having a capillary vaporizer adjacent a heat source, transfers heat to a heat sink by vaporization and condensation of a heat transfer

fluid within the device. A first passage is provided for conveying vapor from the capillary vaporizer to the heat sink. Another passage which is essentially a continuation of the first passage, conveys condensed liquid from the heat sink to the vaporizer, thus allowing the distance that the liquid must flow through capillary material to be quite short. Contact of the returning liquid with the surface of the vaporizer is assured by providing means for maintaining the temperature of the liquid in the return line at a sufficiently low temperature that any vapor will condense; or, alternatively, by having means for extracting any vapor formed in the returning liquid. In this manner, the heat link operates with high heat flux without any substantial resistance to liquid flow through a long capillary



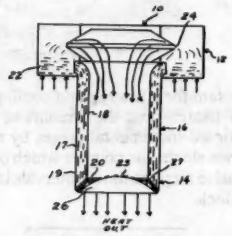
flow path. By this replacing almost all of the liquid return wick, with its high resistance to fluid flow, of heat pipes with a low flow resistance liquid passage or conduit, the heat flux capacity of the heat link is greatly increased over that of the heat pipe while the quantity of porous material used and the heat link weight are considerably reduced so that a heat link typically has 10 to 1,000 times the heat flux capacity of a heat pipe having the same weight. "Boosted" embodiments of the heat link employing additional means for circulating the fluid, such as vapor jet pumps, powered at least in part by vapor from the capillary vaporizer, are also described. Some "-boosted" heat links are capable of handling heat fluxes in the multi-megawatt range while having no moving parts except for check valves and the fluid itself.

3,677,337

HEAT TRANSFER APPARATUS WITH OSMOTIC PUMPING

Lawrence L. Midolo, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 10, 1970, Ser. No. 70,977
Int. Cl. F28d *15/00*
U.S. Cl. 165—105 **10 Claims**



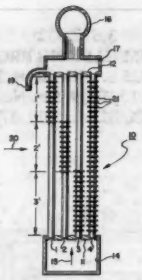
An apparatus for transferring thermal energy from a heat source to a heat sink having a closed space containing a saline solution and an evaporator wherein the heat input evaporates the liquid so that a water vapor moves toward a condenser where heat is rejected to return the water vapor to the liquid phase. The closed space containing the saline solution extends to the region of the condenser and has a water permeable membrane positioned adjacent the condenser. The water is returned to the evaporator by osmotic pumping.

3,677,338

SURFACE CONDENSER

Fred W. Staub, Scotia, N.Y., assignor to General Electric Company

Filed Feb. 17, 1971, Ser. No. 116,068
Int. Cl. F28b *1/06*
U.S. Cl. 165—111 **8 Claims**



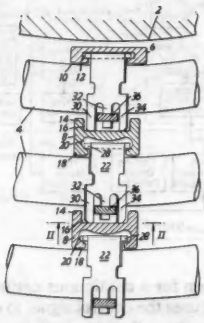
In a surface condenser including a plurality of parallel tubes arranged in a plurality of parallel rows between an inlet and an outlet manifold for condensing a vaporous medium by a stream of coolant, freeze-up of the tubes is prevented and improved performance is provided by selectively finning the tubes. The tubes in the row adjacent the upstream end of the stream of coolant are finned along a section adjacent the outlet manifold. Rows progressively farther removed from the upstream end of the coolant are finned in sections located progressively closer to the inlet manifold. Sections located progressively closer to the inlet manifold are progressively longer. Accordingly, uniform flow of coolant on the outside surfaces of the tubes and a balanced flow of vaporous medium through the tubes are provided, and in addition contact between excessively low temperature coolant and tubes containing insufficient vapor is prevented.

3,677,339

COILED TUBE BANKS

Alfred J. Perrin, 2 Windermere Av., Kenton, Harrow, Middlesex; John D. Dell, 10 Lovell Close, Henley-on-Thames, Oxfordshire; David B. Evans, 9 Clifford Avenue, Cranmore Park, Chislehurst, Kent, and George Stanley Lewis, 28 Beechwood Close, Little Chalfont, all of England

Filed Jan. 15, 1970, Ser. No. 3,088
Int. Cl. F22b *37/20*; F28d *7/10*
U.S. Cl. 165—162 **4 Claims**



A tube bank arrangement comprising a plurality of concentric coils provided with spacing means and including, for each coil, at least one spacer bar extending parallel to the axis of

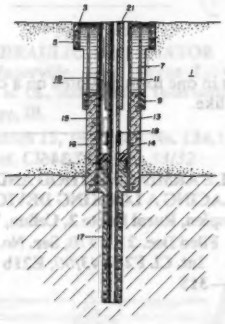
the tube bank. The spacer bar being aligned with the spacer bar of the next adjacent coil and including radially extending lugs mounted on one of the two adjacent spacer bars and straddling the coil segments passing therebetween. The lugs maintaining the spacing between adjacent spacer bars and cooperating with a locking strip to secure the coil segments to the associated spacer bar.

3,677,340

PERMAFROST COMPLETION

Elmo M. Blount, Irving; Earl S. Snavely, Jr., Arlington; Joseph U. Messenger, Dallas, all of Tex., and Nicolas J. Prueger, Spenard, Alaska, assignors to Mobil Oil Corporation

Filed July 23, 1970, Ser. No. 57,635
Int. Cl. E21b *43/00*
U.S. Cl. 166—315 8 Claims



This specification discloses completion methods for wells drilled through permafrost zones of the earth. Two concentric strings of casing are set in a well and liquid is withdrawn from the annulus intermediate these casing strings adjacent the permafrost zones, leaving the annulus dry. Thereafter, insulation is installed in the dry annulus adjacent the permafrost zones.

3,677,341

HANGER AND PACKER WELL TOOL

Erwin Burns, and Alan D. Stevenson, both of c/o 8346 Salt Lake Avenue, Bell, Calif.

Filed Feb. 8, 1971, Ser. No. 113,151
Int. Cl. E21b *43/10*
U.S. Cl. 166—124 11 Claims

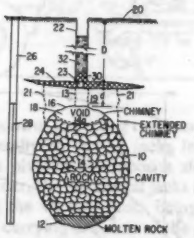
A combination oil well liner hanger and packer with a related setting tool which is such that the packer can not be actuated to seal between the tool and a surrounding casing until after the casing engaging slips have been set in engagement with and between the tool and said casing. The tool including novel latch means to releasably hold relatively rotatable parts in their normal unactuated position and utilizing elements and parts of the liner hanger means and the actuating means for said liner hanger means and the packer means; and further including novel means for cooperatively receiving and establishing quick and easy fluid tight connection with a sealing tool on the lower end of a fluid conducting tubing string, above the tool, after it has been set in the casing.

3,677,342

METHOD OF INCREASING SIZE OF UNDERGROUND NUCLEAR CHIMNEY

Daniel Silverman, Tulsa, Okla., assignor to Pan American Petroleum Corporation, Tulsa, Okla.

Filed Dec. 29, 1969, Ser. No. 888,577
Int. Cl. E21b *43/26*
U.S. Cl. 166—247 4 Claims



An underground cavity formed deep in the earth by detonation of a nuclear device is extended vertically by drilling a borehole from the earth's surface to a depth D which is above the expected top of the cavity chimney by a distance equal to or greater than *d*, where *d* is the thickness of a slab of rock of the diameter of the chimney that will be self-supporting. A horizontal propped fracture is created at depth D, and liquid explosive is placed in the fracture and detonated. The shock force of the explosion causes the slab of thickness *d* to be rubbleized and driven down into the chimney. This process can be repeated for successive slabs of thickness *d*. Alternatively, vertical boreholes can be drilled outside of an adjacent the wall of the cavity, vertical fractures created with their planes parallel to the wall of the borehole, the fractures loaded with liquid explosive and detonated, causing a slab of the wall to be driven into the chimney and rubbleized.

3,677,343

METHOD FOR IMPROVING THE INJECTION PROFILE OF A WATER INJECTION WELL

William E. Showalter, Seal Beach, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed July 16, 1970, Ser. No. 55,339
Int. Cl. E21b *43/22*
U.S. Cl. 166—252 5 Claims

A method for improving the injection profile of flood water into a heterogeneous subterranean formation penetrated by a

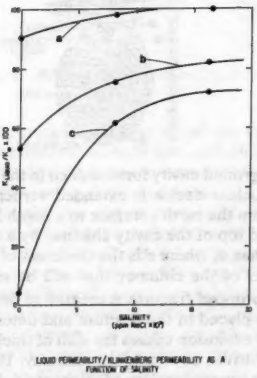
water injection well which comprises first establishing a flow of flood water into the formation through the injection well such that the velocity of the water in the well is sufficient to transport subsequently injected solid diverting agent particles down the well and, while maintaining a substantially constant flow of flood water into the well, dispersing in the flood water particles of a solid water-insoluble diverting agent.

3,677,344

MOBILITY CONTROL IN FLOODING RESERVOIRS CONTAINING WATER-SENSITIVE CLAY MINERALS

John B. Hayes, and Bruce L. Knight, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Sept. 22, 1970, Ser. No. 74,336
Int. Cl. E21b *43/22*
U.S. Cl. 166—252 **13 Claims**



LIQUID PERMEABILITY/KLINKENBERG PERMEABILITY AS A FUNCTION OF SALINITY

Improved mobility control in flooding an oil-bearing subterranean formation containing water-sensitive clay minerals is obtained by injecting into the formation a micellar dispersion containing a lower concentration of electrolytes than is present in the interstitial water of the formation, the effect being to impart a reduced permeability to the flow of the micellar dispersion through the formation and thus obtain better mobility control of the process. A mobility buffer can optionally be injected behind the micellar dispersion, the buffer containing a lesser concentration of electrolyte than the electrolyte within the interstitial water; the result being to obtain reduced permeabilities to the flow of the buffer and thus better mobility control.

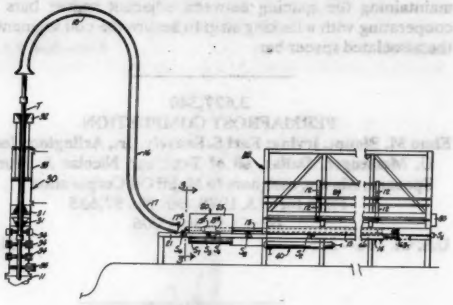
3,677,345

PIPE HANDLING APPARATUS AND METHOD

Phillip S. Sizer, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 13, 1970, Ser. No. 36,875
Int. Cl. E21b *43/00, 19/00*
U.S. Cl. 166—315 **22 Claims**

Apparatus for handling pipe, making up joints of pipe into an elongate string, inserting the string into a well and removing it from the well with a minimum of manual handling. Pipe joints are racked in units which are made up in a substantially horizontal position and flexed around curves into a well bore and out of a well bore, without the use of conventional hoisting equipment. A basket type circular receiving vessel or receptable is provided for coiling the string of pipe as it is removed from the well bore and for insertion into the well bore if the pipe string is not to be broken into separate lengths or sections. Means is provided for storing the pipe in either the horizontal racks or in the basket in a coil. The pipe handling



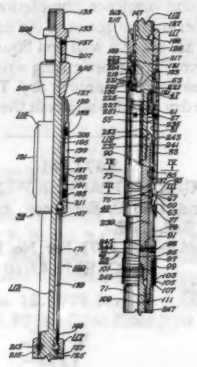
equipment is in one form mounted on a conveyance such as a barge or the like.

3,677,346

REVERSIBLE ARMING METHOD AND APPARATUS FOR EMPLACING A LOCKING DEVICE IN TUBING

Jack W. Tamplen, Rural Route 2, Celina, Tex.

Filed Dec. 21, 1970, Ser. No. 99,752
Int. Cl. F21b *43/00*; E21b *23/00*
U.S. Cl. 166—315 **50 Claims**



A locking device and method and apparatus for emplacing same within tubing in a well characterized by having locking dogs that are run into the well retracted; and that are reversibly operable into a no-go, or armed, position at a desired depth for thereafter stopping the locking device at the top of a restricted portion such as a nipple; and that are lockable into a recess such as defined by a landing nipple or a collar immediately above the restricted portion. Both the running tool employed in emplacing the locking device, and the locking device, can be armed into and disarmed from the no-go position but cannot be inadvertently locked in the tubing until the locking dogs encounter the restricted portion. Also disclosed are specific and preferred structural embodiments wherein the running tool and the locking device are reversibly armed and the locking device locked and left in the tubing by reciprocal movement of the tool in the tubing, which operates slot arrangements and a driven sleeve and without the use of complicated electric motors, hydraulic connections or the like; and wherein a simplified tool is employed for setting in the top nipples in the tubing.

3,677,347

METHOD OF EXTINGUISHING FIRES AND COMPOSITIONS THEREFOR CONTAINING CATIONIC SILICONE SURFACTANTS

Meyer R. [illegible], Irvington, and Bela Prokai, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,341
Int. Cl. A62c *1/12*; A62d *1/00*
U.S. Cl. 169—1 A 31 Claims

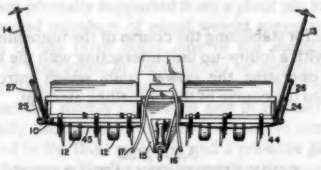
Cationic siloxanes in the liquid phase of fire extinguishing foams, with or without other materials as foam promoters, stabilizers or special purpose additives, provide rapid extinguishment of flames, are capable of forming vapor-securing films over burning hydrocarbon liquids to prevent reignition upon foam rupture or disintegration and impart unique elastic properties useful in producing high expansion foams and in producing low expansion foams for sprinkler systems.

3,677,348

HYDRAULIC ALTERNATOR

Charles Boetto, Naperville, and Wayne L. Orkwiszewski, Romeoville, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed March 15, 1971, Ser. No. 124,140
Int. Cl. A01b *41/06*, *33/32*
U.S. Cl. 172—2 9 Claims



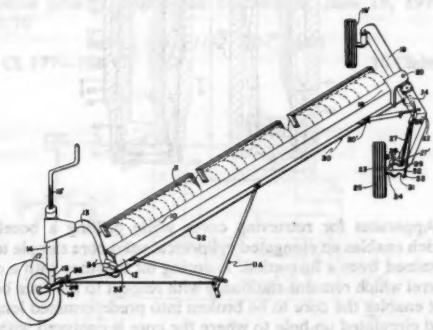
An implement vertically movable between an operating and transport position including a row marker on each side of the implement that is raised and lowered by a separate hydraulic cylinder. The cylinders receive fluid from a common source through a valve that is controlled by actuating means that are responsive to vertical movement of the implement.

3,677,349

STEERING DEVICE FOR CULTIVATING IMPLEMENTS

Robert J. Gugin, Minnedosa, Manitoba, Canada, assignor to Agristeel Limited, Minnedosa, Manitoba, Canada

Filed March 27, 1970, Ser. No. 23,435
Int. Cl. A01b *69/00*
U.S. Cl. 172—285 1 Claim



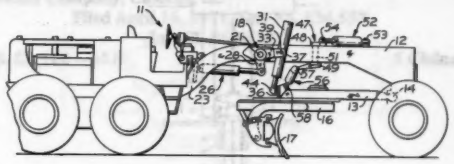
A cable extends between an arm on the front furrow wheel, around guiding elements, to a further arm on the land wheel so that movement of one wheel initiates corresponding movement of the other wheel against spring pressure on the land wheel which maintains the cable taut under all conditions.

3,677,350

HYDRAULIC MOTOR GRADER BLADE LIFT, CENTERSHIFT CONTROL

Harold M. Johnson, and Russell D. Page, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 2, 1970, Ser. No. 86,110
Int. Cl. E02f *3/12*
U.S. Cl. 172—789 9 Claims



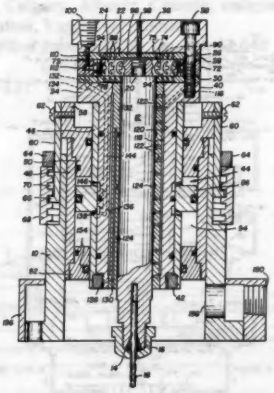
An all-hydraulic control including two sets of vertically extending and horizontally extending jacks interconnected in pairs by bell cranks pivoted on opposite sides of the main frame of a motor grader, the horizontal jacks being coupled to the main frame and the vertical jacks being coupled to the blade support circle carrying drawbar of the grader, whereby correlated actuation of the jacks controls the elevation of the blade. The lift linkage is complemented by a centershift control linkage which includes a pivotable member rotatable on the frame about a vertical axis, a jack acting between the frame and the pivotal member, and a jack acting between the pivotal member and the drawbar. The centershift control jacks are actuated individually or jointly in combination with the lift linkage to provide minor or extreme lateral blade adjustments. The overall linkage accomplishes complete control conveniently while maintaining excellent operator visibility about the blade and forward part of the vehicle.

3,677,351

ROTARY TOOL AND TURBINE THEREFOR

Ulrich M. Geissler, Ft. Lauderdale, Fla., assignor to Harrington-Geissler & Associates, Inc., Dania, Fla.

Filed Oct. 6, 1970, Ser. No. 78,383
Int. Cl. B25d *9/00*; B23b *45/04*
U.S. Cl. 173—57 20 Claims



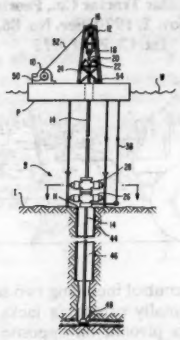
A rotary tool comprising a housing in which a spindle is mounted. The spindle being driven by air turbine, and having an air cushion bearing. The turbine simultaneously is provided with an air cushion bearing. Means are provided for pneumatically extending and retracting the spindle.

3,677,352

BLOWOUT PREVENTION APPARATUS FOR SUBAQUEOUS DRILLING

Samuel H. Lloyd, Los Angeles, Calif., assignor to Santa Fe International Corporation, Los Angeles, Calif.

Filed April 20, 1970, Ser. No. 30,184
Int. Cl. E21c 19/00
U.S. Cl. 175—7 11 Claims



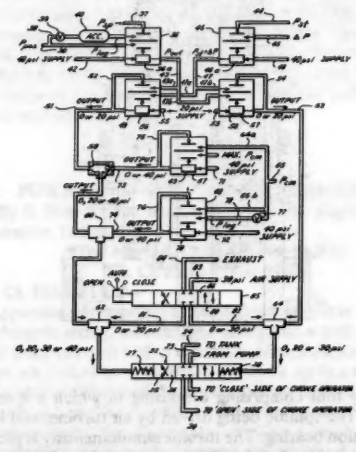
The apparatus includes a vessel carrying a derrick and composite main electric and hydraulic draw works, each being dead ended to the other. In normal operations, the main draw works is employed to raise and lower the drill string with the anchor line dead ended to the hydraulic draw works. When a "kick" or other abnormality in the well occurs and the blowout preventors are actuated, the drill string is lowered such that a tool joint rests on the blowout preventer rams. The hydraulic draw works is then actuated and provides a constant tension on the drill string whereby the rams support the drill string below the rams and the hydraulic draw works supports the drill string above the rams. The constant tension hydraulic draw works precludes relative motion between the drill string and the ram heads which motion would otherwise occur due to vessel motion.

3,677,353

APPARATUS FOR CONTROLLING WELL PRESSURE

Gerald S. Baker, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed July 15, 1970, Ser. No. 55,105
Int. Cl. E21b 7/00
U.S. Cl. 175—25 14 Claims



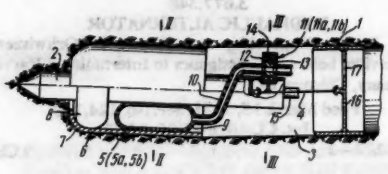
There is disclosed apparatus which includes a choke for connection to the annulus between a well bore and a drill string extending into the bore, and a means for operating the choke to impose a back pressure on drilling fluid in the annulus either manually or automatically in response to certain well characteristics so as to maintain a predetermined pressure differential between it and formation fluid at the bottom of the well bore.

3,677,354

DEVICE FOR STABILIZING THE COURSE OF THE TUNNELLING ELEMENT

Alexandr Dmitrievich Kostylev, ulitsa Derzhavina, 19, kv. 42; Konstantin Stepanovich Gurkov, ulitsa Derzhavina, 19, kv. 68; Khai Berkovich Ikach, ulitsa Televizionnaya, 11, kv. 11, and Nikolai Prokhorovich Chepurnoi, prospekt Dzerzhinskogo, 25a, kv. 53, all of Novosibirsk, U.S.S.R.

Filed Dec. 15, 1970, Ser. No. 98,273
Int. Cl. E21b 7/10
U.S. Cl. 175—76 2 Claims



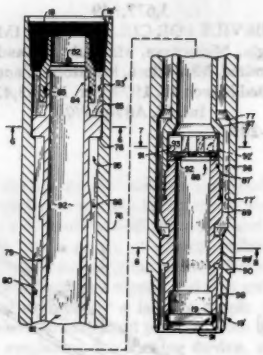
A device for stabilizing the course of the tunnelling element, provided with a follow-up unit interacting with the walls of the hole and operating the power units which introduce corrections into the course of the tunnelling element.

3,677,355

CORE RETRIEVING APPARATUS

Wayland D. Elenburg, P.O. Box 1588, Monahans, Tex.

Division of Ser. No. 831,361, June 9, 1969, Pat. No. 3,596,723, which is a continuation-in-part of Ser. No. 714,551, March 20, 1968, Pat. No. 3,473,617. This application Dec. 16, 1970, Ser. No. 98,634
Int. Cl. E21b 9/20
U.S. Cl. 175—215 11 Claims

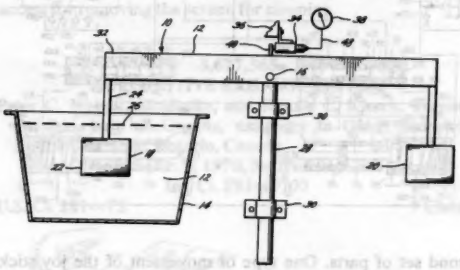


Apparatus for retrieving cores while drilling a borehole which enables an elongated cylindrical solid core sample to be obtained from a formation. A coring bit together with a core barrel which remains stationary with respect to the core being cut enables the core to be broken into predetermined lengths and circulated up-hole to where the core is captured within a core retriever made in accordance with the present invention, and which enables the intact core to be removed from the drill string.

ERRATUM

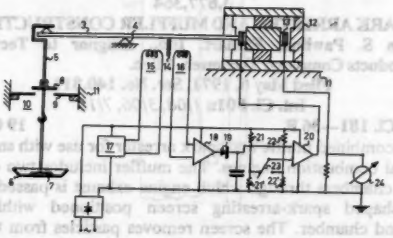
For Class 177—15 see:
Patent No. 3,678,204

3,677,356
WEIGHING APPARATUS FOR LIQUIDS
Zeno E. Goodwin, P.O. Box 2354, Morgan City, La.
Filed Aug. 6, 1971, Ser. No. 169,720
Int. Cl. G01g *1/22, 5/02, 5/04*
U.S. Cl. 177—190 7 Claims



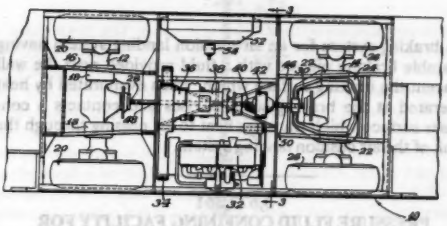
A weighing apparatus for weighing liquids which includes a balance beam pivotally supported from a pivot pin and having first and second members of equal weight supported on opposite sides of the pivot point, one of the members being adapted to be positioned in the liquid to be measured for displacing a predetermined volume of liquid. A fluid piston and cylinder assembly fixedly supported and in contact with the beam whereby the buoyant force exerted on the one member is transmitted to the fluid assembly and a pressure gauge connected to the assembly for measuring the pressure therein which is an indication of the weight of the liquid in which the one member is inserted. The one member including first and second horizontal sections of different cross-sectional areas with the upper cross-sectional area being smaller whereby the volume of fluid being displaced when the member is inserted in the fluid is accurately measured. The beam including a vertical extending shoulder adjacent the pivot point which is in contact with the fluid assembly thereby multiplying the buoyant force applied by the liquid to the fluid assembly.

3,677,357
ELECTROMAGNETIC LOAD COMPENSATED WEIGHING APPARATUS INCLUDING DAMPING
Max Baumgartner, Etzelstrasse 4, CH-8712, Stafa, Switzerland
Filed May 21, 1971, Ser. No. 145,718
Claims priority, application Switzerland, June 18, 1970, 8618/70
Int. Cl. G01g *1/22, 7/04, 23/06*
U.S. Cl. 177—188 10 Claims



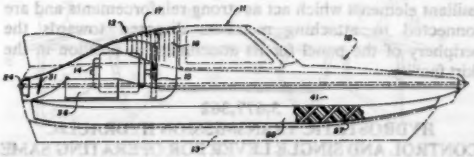
Weighing apparatus of the electromagnetic load compensation type including a vertically movable load suspension member, characterized by the provision of damping means for damping pendulum oscillations of the load suspension member when said member is in a given damping position relative to the frame of the apparatus, and control means for interrupting the weighing operation of the apparatus and for utilizing the electromagnetic load compensating means to place the load suspension member in the damping position.

3,677,358
DRIVE TRAIN FOR LOW PROFILE VEHICLE
Robert G. Luft, Wildwood, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed April 16, 1971, Ser. No. 134,557
Int. Cl. B60k *5/08*
U.S. Cl. 180—44 R 5 Claims



A compact drive train for a low profile vehicle positions the engine, torque converter and transmission between the vehicle axles, the engine being offset from the longitudinal centerline of the vehicle and the transmission being positioned on the centerline of the vehicle in side-by-side relationship with the engine, and both axles being driven from a drop box by means of a pair of drive shafts, one of which extends underneath the transmission.

3,677,359
AIR CUSHION VEHICLE
Dan E. Gray, Calgary, Alberta, Canada, assignor to Shair of Canada Limited, Vancouver, Canada
Filed June 5, 1970, Ser. No. 43,840
Int. Cl. B60v *1/14, 1/16*
U.S. Cl. 180—121 3 Claims

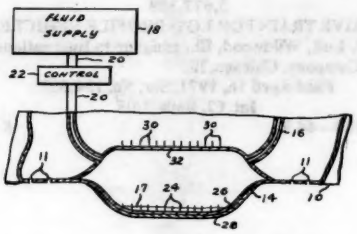


A ground effect machine in which the skirt is divided into a plurality of rearwardly directed and separate compartments so as to be less vulnerable to damage and to obtain thrust from the air issuing from the skirt.

3,677,360
HEAT REMOVAL SYSTEM FOR BRAKES

Kennerly H. Digges, Kettering, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Feb. 23, 1971, Ser. No. 118,011
Int. Cl. B60v 1/00
U.S. Cl. 180—124 6 Claims

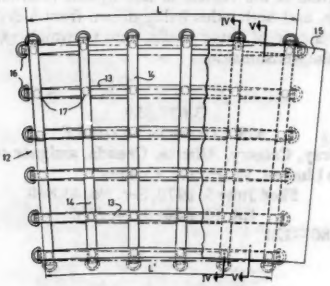


A braking system for an air cushion landing system having inflatable braking pillows with a fluid provided near the wall adjacent the braking surface which, when evaporated by heat generated at the braking surface, rises and contacts a condenser surface which transfers heat to air passing through the trunk of the air cushion landing system.

3,677,361
PRESSURE FLUID CONFINING FACILITY FOR GROUND-EFFECT MACHINE

Jean Henri Bertin, Neuilly-sur-Seine, France, assignor to Societe d'Etudes et de Development des Aeroglisseurs Marins Terrestres et Amphibies S. E. D. A. M., Paris, France

Filed May 18, 1970, Ser. No. 38,081
Claims priority, application France, May 19, 1969, 6916133
Int. Cl. B60v 1/16
U.S. Cl. 180—127 5 Claims



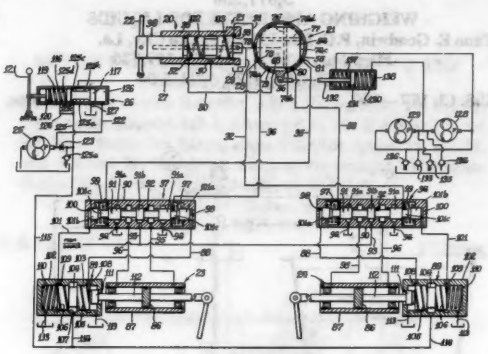
A pressure fluid confining skirt facility for a ground-effect machine formed by a juxtaposition of sealing-tight detachable elementary panels each comprising a network of criss-crossed resilient elements which act as strong reinforcements and are connected to attaching members disposed towards the periphery of the panel for its attachment in position in the skirt facility.

3,677,362
HYDROSTATIC TRANSMISSION HYDRAULIC CONTROL AND SINGLE LEVER FOR OPERATING SAME

Probir K. Chatterjea, Evanston, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Sept. 2, 1970, Ser. No. 69,019
Int. Cl. B62d 11/04
U.S. Cl. 180—6.48 12 Claims

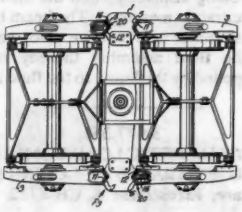
Hydraulic control for two hydrostatic transmissions driving a vehicle. Straight-line movement of certain parts of the hydraulic control moves the vehicle in forward and reverse. Angular movement of certain other parts of the hydraulic control turns the vehicle. A single joy stick is directly connected with the first set of parts, and indirectly connected with the second set of parts. One type of movement of the joy stick causes the vehicle to move in forward and reverse, and another type of movement of the joy stick brings about turning of the vehicle.



3,677,363
DAMPING AND CONTROL DEVICE FOR A BOGIE BOLSTER

Paul Henricot, Ceroux-Mousty, Belgium, assignor to Societe Anonyme Usines Emile Henricot, Saint-Etienne, Belgium

Filed June 22, 1970, Ser. No. 48,349
Int. Cl. B60g 9/00
U.S. Cl. 105—197 D 1 Claim



The invention relates to a damping and control device for a bogie bolster allowing relative movements between sideframes and bolster, said movements being however controlled and damped so as to return to an equilibrium position.

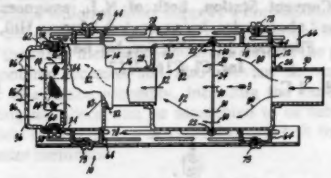
3,677,364
SPARK ARRESTER AND MUFFLER CONSTRUCTION

Julian S. Pawlina, Elkhart, Ind., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed May 6, 1971, Ser. No. 140,811
Int. Cl. F01n 1/08, 3/06, 7/18
U.S. Cl. 181—36 R 19 Claims

A combined muffle and spark arrester for use with small internal combustion engines. The muffler includes two expansion chambers through which engine exhaust is passed and a hat-shaped spark-arresting screen positioned within the second chamber. The screen removes particles from the exhaust having a size greater than the screen mesh to prevent the discharge of potentially dangerous sparks. A curved heat shield is supported on the muffler by a plurality of U-shaped

brackets which are projection welded to the two chambers. The muffler construction is particularly rigid and the muffler

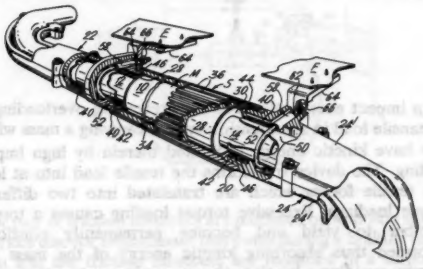


is provided with a removable end cap to provide convenient access for removing the screen for cleaning.

3,677,365
AUTOMOTIVE EXHAUST SYSTEM

Peter C. Wright, Etobicoke, and Donald L. Kirsch, Toronto, Ontario, both of Canada, assignors to Gidon Industries Limited, Rexdale, Ontario, Canada

Filed Dec. 9, 1970, Ser. No. 96,429
Int. Cl. F01m *7/00*
U.S. Cl. 181—72 **7 Claims**

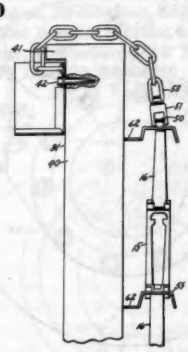


An automobile exhaust system is provided with a muffler having a separate composite outer shell encasing the muffler to provide an auxiliary flow path for exhaust gases escaping from the muffler, the shell having longitudinal reinforcing ribs extending along its central portion serving also as fins for heat dissipation. The shell is of corrosion resistant material suited to withstand damage from road salt, and constructed to facilitate ready access to the muffler of the system.

3,677,366
SELF-STORING FIRE ESCAPE LADDER

Emil Loeffel, 141 Centre Street, Waldwick, N.J.

Filed July 2, 1971, Ser. No. 159,212
Int. Cl. E06c *1/383*
U.S. Cl. 182—70 **7 Claims**



A concealed storage fire escape ladder of the general type disclosed in U.S. Pat. No. 3,547,226, and having structural refinements affording greater strength during use and improved convenience in assembly. Retractable means including a nylon rope affords a shock-absorbing function when the ladder is dropped into position for use. The individual step elements of the ladder are nestable, and utilization of space within a lowermost tread when the device is stored within a storage cabinet permits storage of a chain interconnecting the ladder with the storage cabinet to be stored within said space.

3,677,367
MANUALLY OPERABLE ELEVATOR

Albert Shotmeyer, c/o Shotmeyer Brothers Company, Hawthorne, N.J.

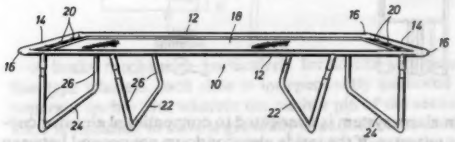
Filed June 14, 1971, Ser. No. 152,740
Int. Cl. A63b *27/02*
U.S. Cl. 182—136 **10 Claims**

A manually operable elevator consisting of a pair of tubular members telescopically interconnected, each tubular member having a manually operable brake cooperable with a rope passing through the tubular members. One of said tubular members includes a seat for the operator. To lower one's self, the operator occupies the seat and controls the rate of descent by applying one or both brakes, one brake operable by the hands, and the other operable by the feet. In ascending, the elevator is raised by alternately locking one tubular member to the rope by applying a brake while raising the other tubular member.

3,677,368
TRAMPOLINE

Victor J. Green, 8121 Barkley Drive, Houston, Tex.

Filed Sept. 25, 1970, Ser. No. 75,363
Int. Cl. A63b *5/00*
U.S. Cl. 182—139 **7 Claims**



A trampoline having a frame formed of tubular material, generally rectangular in shape and supported on legs constructed to yieldingly resist downward movement of the frame bodily and to allow downward yielding movement of a portion of the frame in response to the exertion of a downward impact thereon. The invention includes yieldingly supported pad

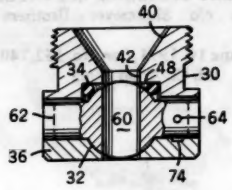
means on the frame of the trampoline positioned to cushion the impact of the user on the frame.

3,677,369

AUTOMOTIVE OIL CRANK CASE DRAIN VALVE

Richard F. Schramm, 4359 Weber Road, St. Louis, Mo.

Filed Jan. 4, 1971, Ser. No. 103,653
Int. Cl. F01m 11/04; F16k 31/44
U.S. Cl. 184—1.5 2 Claims



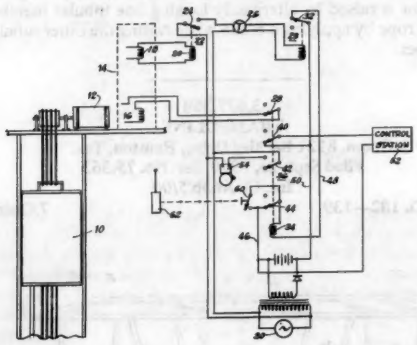
A drain valve for automotive crank cases. The drain valve is substituted for the usual crank case drain plug and is in the form of a threaded plug having a manually operable valve permitting drainage of the crank case oil without removal of the plug. A spherical valve body is seated in a hemispherical valve seat provided in the plug and by means of radial arms extending from the valve body and which are journaled between the plug and a cap, rotation provides for registry of a diametrical opening in the valve body with a plug opening to drain the oil. Operation of the valve arms can be effected either manually, by a screw driver, wrench or the like, or by remote control by linkage connecting the operating arm to a remote control handle on the dashboard of an automobile. A simple cap held in by struckover flanges holds the valve body in the plug and permits ready assemblage.

3,677,370

ELEVATOR ALARM SYSTEM

Edward Devine, Chicago, Ill., assignor to Security Systems, Inc.

Filed Aug. 19, 1970, Ser. No. 65,110
Int. Cl. B66b 3/00
U.S. Cl. 187—37 5 Claims



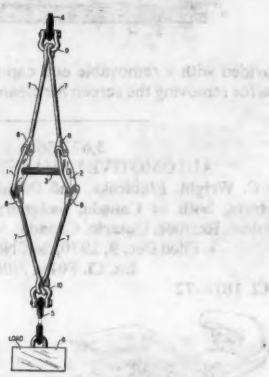
An alarm system is connected to conventional elevator control apparatus. If the inside elevator doors are opened between floors, the conventional switch responsive to such opening will actuate timing means in the alarm system. If the inner doors remain open for a predetermined time interval, a main alarm switch will become operative (1) to signal a remote control station, (2) to energize a local portable alarm, and (3) to deenergize the main elevator drive motor until the main alarm switch is reset.

3,677,371

IMPACT ENERGY ABSORBER

Milton Lutchansky, Randolph Township, and Warren Joseph Rhines, Convent Station, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 27, 1970, Ser. No. 84,407
Int. Cl. F16f 7/12
U.S. Cl. 188—1 C 5 Claims



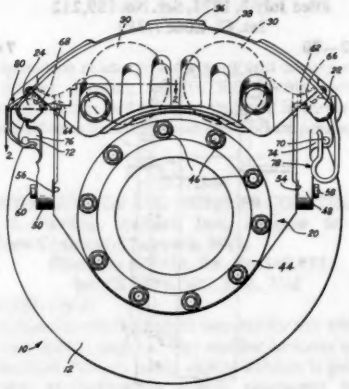
An impact energy absorber for preventing overloading of the tensile load in a suspension system carrying a mass which may have kinetic energy generated therein by high impact loading. The device transforms the tensile load into at least two tensile forces which are translated into two different torque loadings. Excessive torque loading causes a torsion member to yield and become permanently plastically deformed thus absorbing kinetic energy of the mass and thereby avoiding a break in the suspension system that might otherwise result from a sudden acceleration of the suspended mass. A modification of the device increases its energy absorption capacity. Another modification provides a more nearly constant load level during the yielding process.

3,677,372

DISC BRAKE MOUNTING MEANS

Richard T. Burnett, South Bend, Ind., assignor to The Bendix Corporation

Filed Sept. 29, 1970, Ser. No. 76,410
U.S. Cl. 188—73.3 1 Claim



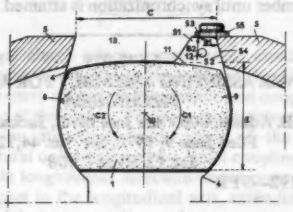
A disc brake is disclosed which includes a three-piece torque member. The inner portion of the torque member is

mounted on the vehicle. A pair of allochiral outer members are secured to symmetrically opposite edges of the inner member. Each of the allochiral outer members are provided with recesses which slidably support a corresponding pin carried by the caliper of the brake. Spring members carried by each of the outer members yieldably maintain the pins in their corresponding recesses and also prevent the caliper from rattling. The brake assembly, including the outer members and spring members, can be assembled to or removed from the vehicle by assembling or removing one bolt through each of the outer members.

3,677,373
DISC BRAKE ASSEMBLY WITH REPLACEABLE FRICTION MEMBERS

Rene Lucien, Neuilly-sur-Seine, France, assignor to Societe Messier, Paris, France

Filed Aug. 7, 1970, Ser. No. 61,971
Claims priority, application France, Aug. 7, 1969, 6927223; Sept. 12, 1969, 6931221
Int. Cl. F16d *55/228*
U.S. Cl. 188—73.6 **15 Claims**

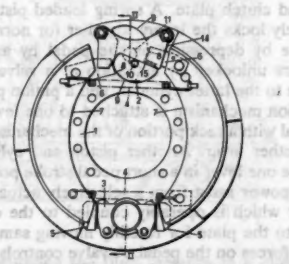


A pair of friction members are mounted on opposite sides of a brake disc for engagement therewith during a braking operation and the friction members are mounted in a stationary housing for replacement. The friction members are generally quadrangular in shape and have opposite curved side surfaces which are rotatably engaged with corresponding side surfaces of the housing. A releasable holding means acts on the friction members to hold the same in position during braking operations. The holding means may be in the form of springs, plates or rods and when they are released, the friction members can be rotated 90° to be removable through a recess in the housing through which the friction members are otherwise not passable when in their original position.

3,677,374
CAM ACTUATED DRUM BRAKE

Charles Newstead, Walsall; John Lesley Cullen, Stratford upon Avon, and Michal Zajko, Coventry, all of England, assignors to Girling Limited, Birmingham, England

Filed June 2, 1970, Ser. No. 42,701
Claims priority, application Great Britain, June 25, 1969, 32,027/69; April 22, 1970, 19,228/70
Int. Cl. F16d *51/22*
U.S. Cl. 188—329 **7 Claims**

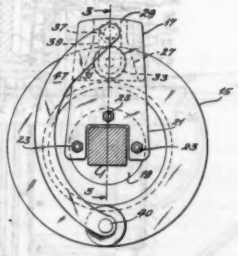


An S-cam drum brake, for example, has shoes each of which pivot at one end when the other ends are forced apart by means of the S-cam but in addition the one end can slide and/or tilt in at least one other mode of movement to provide more even wear and to cater for conicalness of the drum respectively. Shoe pull off springs cooperate with an abutment at said one end to provide a radial inward bias which is counteracted by the cam profile and the profile of a slipper on the shoe there abutting. The abutment is preferably an adjuster. A fixed or variable stop can be used to set a minimum rise position of the S-cam.

3,677,375
VEHICLE BRAKE

Lloyd J. Wolf, 2425 Irving Blvd., Dallas, Tex.

Filed Aug. 31, 1970, Ser. No. 68,164
Int. Cl. F16d *65/34*
U.S. Cl. 188—138 **6 Claims**

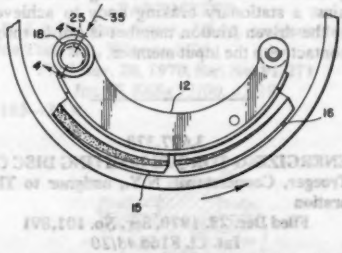


A vehicle brake of the spread shoe type is provided with a ball spreading device for spreading the shoes into braking engagement with a pair of spaced apart disks, there being a lever operatively connected at one end to the latter and at the other end mounting an electromagnet in proximity to one of the disks whereby upon energization of the electromagnet the lever follows the disk, causing the balls to spread and thereby spreading the shoes into braking engagement with the disks.

3,677,376
BRAKE

Joseph W. Barajas, 811 Lovera Blvd., San Antonio, Tex.

Filed May 18, 1970, Ser. No. 38,334
Int. Cl. F16d *51/22, 65/03*
U.S. Cl. 188—341 **6 Claims**



A brake mechanism, particularly for trucks and buses, of the type wherein each shoe is independently anchored by a separate anchor pin, wherein the anchor pin of the secondary shoe is modified to have a generally eccentric cross-sectional configuration. The pin fits within a circular hole in the brake shoe, and the arrangement is such as to permit the shoe, when operating as a secondary brake shoe, to move outwardly at its end adjacent the anchor pin in a direction toward the brake drum when actuated. The arrangement does not, however, permit movement of the anchor pin end of the shoe in the opposite direction from its normal position, i.e., in a direction away from the brake drum. The improved mechanism results

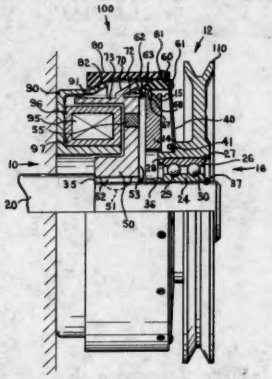
in increased braking effectiveness, more even wear of the brake lining, and vitually eliminates brake squealing.

3,677,377

SELF-ADJUSTING ELECTROMAGNETIC CLUTCH-BRAKE

Donald L. Miller, Horseheads, N.Y., assignor to The Bendix Corporation

Filed March 31, 1971, Ser. No. 129,743
Int. Cl. F16d *67/02*
U.S. Cl. 192—18 B **6 Claims**



An electromagnetic clutch-brake with wear compensating means having mating frusto-conical friction members for transmitting torque and a ferromagnetic armature threaded to one of such friction members for clutch engagement. When the clutch is energized, the armature, which is not in the drive train, comes into contact with the pole faces of the electromagnet, causing the freely mounted armature to rotate with the input member. The relative rotational motion between the armature and the driven friction member causes the driven friction member to advance on its helical thread until engagement with the driving friction member. The output member is driven through a flexible member connected to the driven friction member. As a safety feature, the driven friction member biased by the flexible torque transmitting member is caused to bear against a stationary braking body to achieve braking whenever the driven friction member is not in torque transmitting contact with the input member.

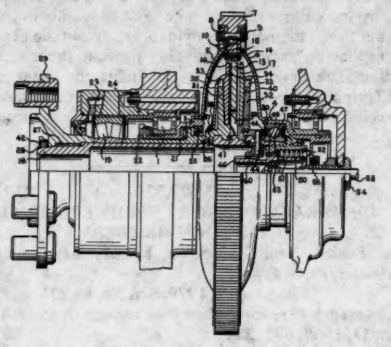
3,677,378

SELF-ENERGIZING TORQUE LIMITING DISC CLUTCH

Henry Troeger, Cooperstown, N.Y., assignor to The Bendix Corporation

Filed Dec. 28, 1970, Ser. No. 101,891
Int. Cl. F16d *43/20*
U.S. Cl. 192—54 R **6 Claims**

A self-energizing, torque limiting, manually controlled disk clutch is disclosed herein. The clutch comprises an actuating member which advances on a helical spline to rotate a pressure plate carrier in response to an input control member. After the pressure plate makes initial contact with the friction disk, the clutch self-energizes to a preset torque capacity selected to accelerate the rotor to synchronism as rapidly as reasonable without stalling the engine. After synchronization opposite motion of the control member will increase torque capacity beyond engine rated torque. Thereafter the clutch cannot be manually disengaged but will disengage when the torque is reduced to a predetermined low or negative value, at which time it will completely disengage and overrun. While overrunning, the clutch can be re-engaged by operation of the input member until synchronization is attained.

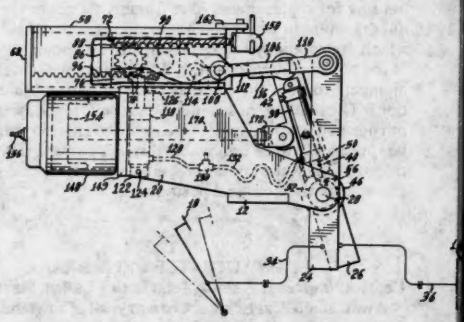


3,677,379

POWER ASSISTING ASSEMBLY FOR A CLUTCH MECHANISM

Madison B. Adams, 8063 San Jose Blvd., Jacksonville, Fla.

Filed June 9, 1970, Ser. No. 44,724
Int. Cl. F16d *25/08*
U.S. Cl. 192—91 R **29 Claims**



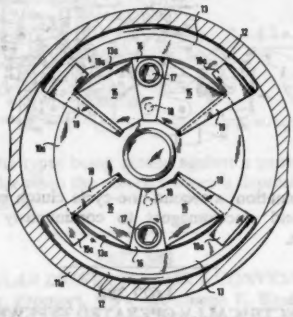
The assembly includes a pair of levers with a link between one lever and clutch pedal and another link between the other lever and clutch plate. A spring loaded piston and cylinder selectively locks the levers together for normal actuation of the plate by depression on the pedal by an operator. The levers are unlocked by actuation of a valve to supply fluid pressure to the latter cylinder, and a pinion portion of a rack and pinion mechanism is attached to one lever connected to the pedal with a rack portion of the mechanism being coupled to the other lever. Another piston and cylinder selectively locks the one lever in a short pedal stroke position for receiving the power assist from a selectively actuatable piston and cylinder which is operably coupled to the other lever connected to the plate for forcibly moving same in response to control forces on the pedal. A valve controls the latter piston and cylinder upon control forces being applied to the pedal by an operator to supply pressurized fluid thereto.

3,677,380

COUPLING OPERATING BY CENTRIFUGAL FORCE

Gerhard Kirschey, Ittertaler Strasse 52, 56 Wuppertal-Vohwinkel, Germany

Filed March 1, 1971, Ser. No. 119,534
Claims priority, application Germany, March 2, 1970, P 20 09 607.5
Int. Cl. F16d 23/10
U.S. Cl. 192—105 BA 12 Claims



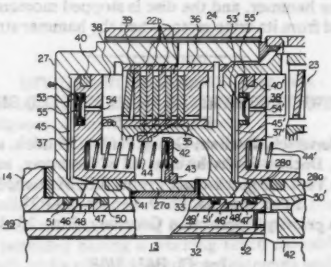
A centrifugal clutch which comprises an elastic coupling element connected with the driving side of the clutch. Centrifuge bodies carry a layer on the outside and cooperate with the driven side of the clutch. The coupling element comprises coupling-cushion structural units. Each of the coupling-cushion structural units includes two equal coupling cushions, pretensioned in longitudinal direction under pressure against each other, upset in the longitudinal axis, extending substantially in secantial planes and disposed at an angle toward each other. The units are connected at their sides pointing toward each other with a coupling-cushion connector formed as a driving stay connected with the driving side of the clutch. A centrifuge body segment engages the coupling-cushion structural-unit on the outside curve-like surrounding on the opposite ends of the coupling cushions. The centrifuge body segment engages the driving stay with the coupling cushion structural unit formed as a pretensioned coupling-built-in-segment by abutment of the inner side of the centrifuge-body segment pointing toward the coupling-cushion structural unit, thereby shot-cutting all pretension forces.

3,677,381

HYDRAULIC CLUTCH WITH DUMP VALVE

Takeshi Takagi; Tamio Kawamoto, and Toshio Miyazaki, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed June 2, 1970, Ser. No. 42,697
Claims priority, application Japan, June 30, 1969, 44/51680
Int. Cl. F16d 25/00
U.S. Cl. 192—106 F 5 Claims



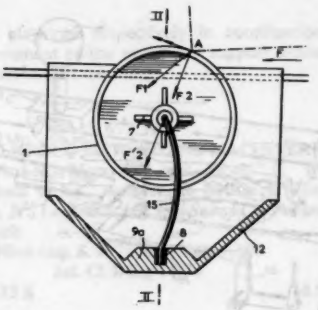
Means for regulating the fluid pressure in a clutch servo mechanism of an automatic transmission for automotive vehicles, said means comprising an orifice control valve device having a center plate, a plurality of radial extensions extending radially from the center plate, and arms circumferentially extending from each of the radial extensions and tilted axially, which arms serve as spring means to regulate the closing and opening of the valve device.

3,677,382

FLEXIBLE BEARING FOR A CONVEYOR ROLLER CAPABLE OF BEING INCORPORATED IN A ROLLING PLANE

Georges Coppel, St. Ouen, France, assignor to "Constructions Mills-K", Saint-Ouen, France

Filed Feb. 9, 1971, Ser. No. 113,873
Claims priority, application France, Feb. 17, 1970, 7005707
Int. Cl. B65g 13/00
U.S. Cl. 193—35 B 8 Claims



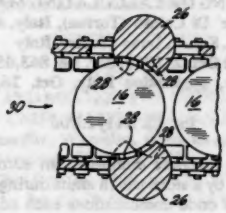
A conveyor roller bearing which supports the center of the roller through a flexible structure. The latter comprises two branches of a spring wire which have two lateral coaxial portions inserted in the roller on each side of the latter. The branches have lower end portions anchored in the bottom of a fork-shaped support. The branches are arcuate and have a concavity facing in the direction of the destination of the objects which pass over the roller. Oblique lateral abutments on the lateral walls of the support enable an additional force of compression to be applied to the arcuate branches.

3,677,383

PART METER

Donald P. Lamb, Ann Arbor, Mich., assignor to La Salle Machine Tool, Inc., Warren, Mich.

Filed Nov. 20, 1970, Ser. No. 91,271
Int. Cl. B65g 13/00, 47/29
U.S. Cl. 193—35 A 2 Claims



A meter for use in a conveyor system for parts in which the parts flow in one direction along a track and it is desired to interrupt the flow of parts at one point in their travel along the track and eject the parts singly from that point. The part meter

comprises a pair of generally cylindrical body members which are substantially parallel and are mounted for rotatable movement. The body members are provided with grooved portions located adjacent the track and capable of engaging a part so as to interrupt its flow and also of forming a path through the meter through which a single interrupted part can flow. A fluid actuated cylinder assembly is operable to concurrently rotate the body members between positions in which they interrupt parts and provide the desired path through the meter.

3,677,384

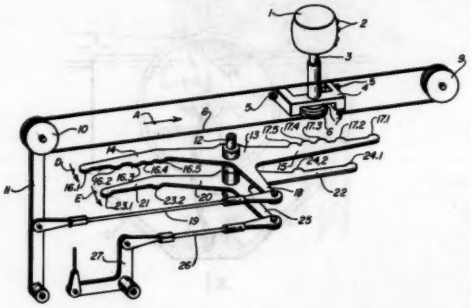
MECHANISM FOR POSITIONING SINGLE ELEMENT TYPE CARRIERS

Manfred Link, Nuernberg, Germany, assignor to Triumph Werke, Nuernberg, Germany

Filed Dec. 16, 1970, Ser. No. 98,695

Int. Cl. B41J *23/02*

U.S. Cl. 197—16 **10 Claims**



Mechanism is provided to selectively rotate and tilt a single element type carrier to position a character in a selected row and column location for printing. Rotation and tilt from a rest position is effected by spring biased cranks normally held in a rest position by a fixed stop on one of a pair of cyclically operable bails. The rest position defining stop is located farthest from the bail pivot in the path of contact surfaces on the cranks. Other stops on the bails are located at various distances from the bail pivots and are selectively positionable for cooperation with contact surfaces located at various distances from the crank pivots where-by the degree and direction of rotational movement of the cranks are controlled according to the distance of positioned stops on the bails from their pivots as the bails are oscillated or, if no stop is positioned then by the fixed stop.

3,677,385

AUTOMATIC WRITING ARRANGEMENTS FOR ACCOUNTING OR CALCULATING MACHINES

Franco Bretti, Are' Di Caluso (Torino), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

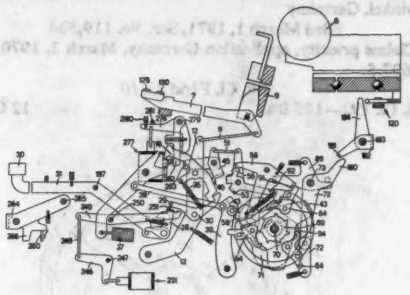
Filed Oct. 2, 1969, Ser. No. 863,058

Claims priority, application Italy, Oct. 26, 1969, 53640 A/68

Int. Cl. B41J *23/08*

U.S. Cl. 197—19 **2 Claims**

An accounting machine comprises an automatic printing device controlled by a store which emits during a data transfer period a group of code combinations each adapted to select the type to be printed. The printing device includes a one-cycle clutch adapted to be engaged each time for printing the selected type. A locking element is actuated by a synchronizing electromagnet throughout the said transfer period in such manner as to lock the clutch in the engaged position, whereas the code combinations are called up synchronously to cause the synchronous printing of the corresponding characters. To actuate the spacing mechanism repeatedly by a particular



code combination, a second one-cycle clutch is conditioned by a second electromagnet to continuously actuate the mechanism.

3,677,386

ELECTRICALLY OPERATED TYPEWRITER

Walter Herterich, Dachau; Georg Probst, Munich, and Bruno Wurm, Dachau-Rothschwelge, all of Germany, assignors to Ecofon Verkaufsgesellschaft Probst KG, Munich, Germany

Filed June 23, 1970, Ser. No. 49,031

Claims priority, application Germany, June 26, 1969, P 19 32 481.3

Int. Cl. B41J *1/22*

U.S. Cl. 197—53 **10 Claims**

An electrically operated typewriter in which type carried on the radially slotted circumference of a rotating disc is driven against paper by an electromagnetically operated hammer when a type selected by pressing a key of a keyboard is in the path of the hammer, and the disc is stopped momentarily and uncoupled from its drive motor when the hammer strikes.

3,677,387

ELECTRIC TYPEWRITER WITH PRINTED CIRCUIT KEYBOARD

Walter Herterich, Dachau; Georg Probst, Munich, and Bruno Wurm, Dachau-Rothschwelge, all of Germany, assignors to Ecofon Verkaufsgesellschaft Probst KG, Munich, Germany

Filed June 23, 1970, Ser. No. 49,027

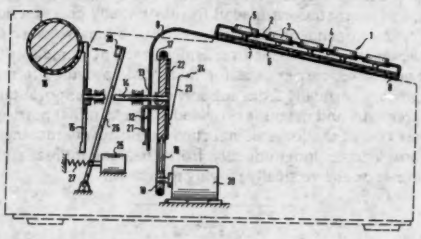
Claims priority, application Germany, June 26, 1969, P 19 32 518.9

Int. Cl. B41J *5/08*

U.S. Cl. 197—98 **10 Claims**

An electric typewriter in which a printed circuit board is arranged under the keys of the keyboard, respective conductive

areas of the circuit being associated with the keys and connected conductively to an amplifier through a synchronizing



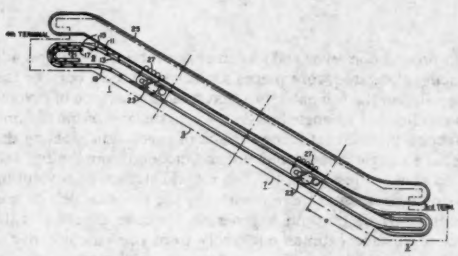
mechanism, the types being moved against a paper wrapped about a cylinder when the associated key is depressed toward the printed circuit.

3,677,388

MODULAR DRIVE UNIT FOR A CONVEYOR

Henry Boltrek, Freeport, N.Y., and Joseph K. Kraft, Verona, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 23, 1970, Ser. No. 91,959
Int. Cl. B65g *23/16*; B66b *9/12*
U.S. Cl. 198—16 **19 Claims**



A multiple strand driving chain is lifted into engagement with teeth carried on the endless belt of a conveyor by sprocket wheels which straddle the teeth. Preferably such multiple strand driving chains are incorporated into a modular drive unit where they are urged into engagement with the teeth on the top and bottom runs on both sides of the endless belt. Additionally, the teeth on the endless belt may be provided with a negative pitch angle whereby the multiple strand chain is drawn into and retained in engagement with the teeth on the endless belt throughout the distance between the sprocket wheels. The multiple strand driving chains are longitudinally adjustable with respect to the teeth on the moving belt.

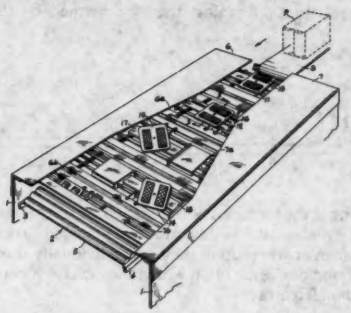
3,677,389

DIVIDER-ROTATOR MECHANISM

Victor Benatar, Atlanta, and Roy A. Johnson, Marietta, both of Ga., assignors to The Mead Corporation

Filed Oct. 21, 1970, Ser. No. 82,758
Int. Cl. B65g *47/24*, *47/26*
U.S. Cl. 198—31 AB **4 Claims**

For dividing a series of items moving in a single row into two or more rows and for rotating certain of the items, conveyor means is provided having a working reach movable along a straight path and a plurality of support elements and a plurality of support plates are mounted on the conveyor and arranged for transverse sliding movement thereon together with a plurality of platforms rotatably mounted respectively on the support elements and a plurality of abutment elements are mounted on the conveyor in fixed relationship thereon adjacent the support elements respectively for engaging parts of



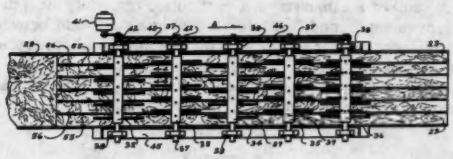
the rotatable platforms respectively in coordination with transverse movement of the associated support elements to impart rotary movement thereto.

3,677,390

LEAF ALIGNING METHOD AND MACHINERY

Samuel A. Parker, Maysville, and Edwin L. Wilding, Louisville, both of Ky., assignors to Griffin & Company; Louis Scheu, Jr., Louisville, Ky. and Samuel A. Parker, part interest to each

Filed Aug. 5, 1970, Ser. No. 61,350
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 R **14 Claims**



Tobacco leaves are aligned in troughs by a combination of mechanical vibrations, rotating doffer structure and optional air flow. The leaves are deposited on a vibrated receiving surface and are conveyed onto longitudinal parallel troughs separated by rims. Skew leaves initially lie on the rims across the troughs, while aligned leaves drop into the troughs. The doffer means includes one or more hubs extending across the troughs and rims, and arms extending from the hubs which brush or move unaligned leaves unsymmetrically to turn them and thereby reorient them. Air orifices may be included in the rims and/or doffer arms to lift or turn unaligned leaves which lie on the trough rims and reorient them.

3,677,391

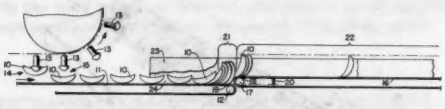
APPARATUS AND METHOD FOR SHINGLING ARTICLES OF UNIFORM NON-PLANAR SHAPE

Richard A. Schaeffer, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 26, 1970, Ser. No. 83,998
Int. Cl. B65g *57/00*, *37/00*
U.S. Cl. 198—35 **10 Claims**

An apparatus and method for handling an advancing column of individual articles of uniform non-planar shape such that the articles which are initially moving in spaced-apart fashion are transformed into a horizontally compact "shingled" relationship. The articles are initially moved in spaced relationship on a first conveyor surface. A second con-

veyor surface is provided which moves at a slower speed and which is mounted in a slightly higher plane just beyond the end of the first conveyor in position to receive the articles therefrom. The articles are continuously moved into a contacting relationship against the stop formed by the second



conveyor at the terminus of the first conveyor to transform the spaced articles into an inventory of shingled articles on the first conveyor whereupon they are individually transferred to said second conveyor upon which the articles form a continuously shingled array.

3,677,392

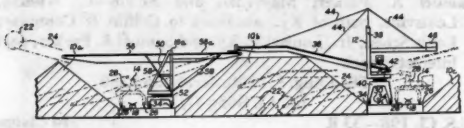
APPARATUS FOR STORING PARTICULATE MATERIAL

Paul Soros, 1102 Oenoke Ridge, New Canaan, Conn.

Filed Sept. 15, 1970, Ser. No. 72,382

Int. Cl. B65g *65/28*

U.S. Cl. 198—36 **5 Claims**



A stacker mechanism in a particulate material stockpiling arrangement is modified to extend over a stack and between an adjacent stacker on one side thereof and an adjacent stack on the opposite side thereof to enable elimination of its stacker feeding conveyor by permitting the modified stacker mechanism to be fed from the adjacent stacker.

3,677,393

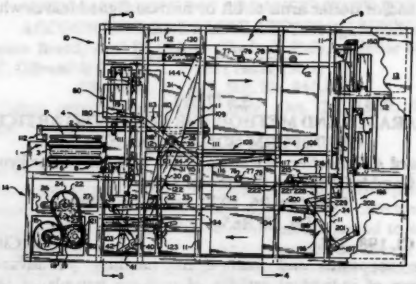
BAKERY PRODUCTS HANDLING APPARATUS

Hiram E. Temple, Ventura, Calif., assignor to Baker Perkins Inc., Saginaw, Mich.

Division of Ser. No. 593,777, Nov. 14, 1966, Pat. No. 3,526,325, which is a division of Ser. No. 332,813, Dec. 23, 1963, Pat. No. 3,319,806. This application June 22, 1970, Ser. No. 48,332. The portion of the term of this patent subsequent to May 16, 1984, has been disclaimed.

Int. Cl. B65g *1/06*

U.S. Cl. 198—85 **3 Claims**



A baker proofer or cooler wherein a series of rack carriers having vertically spaced shelves for supporting bakery products and the like are moved around a conveyor circuit in a continuous path. The carriers are moved along longitudinally extending upper and lower conveyor circuit runs joined at their ends by elevator and lowerator runs and at least one of the lowerator and elevator runs has a series of vertically spaced support stations spaced to substantially correspond to the vertical spacing of the shelves of the rack carriers, so that the carriers may be indexed vertically a shelf at a time. A vertically operative, carrier indexing member is provided to move the carriers vertically from support station to support station in increments and means is provided at the terminal portion of at least one of the longitudinal runs for positively moving the endmost carrier longitudinally from the longitudinal run to position it on the vertically moving member.

3,677,394

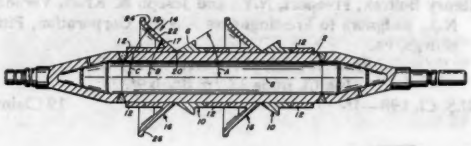
CONVEYOR ROLL

William M. Bloom, Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed April 20, 1970, Ser. No. 29,918

Int. Cl. B60b *15/00*; B21b *31/08*; B65g *13/02*

U.S. Cl. 198—127 **5 Claims**



Improved conveyor roll structure for retaining thereon advancing elongated work pieces such as steel rods, bars, or the like wherein the roll exhibits a first retaining surface of revolution inclined at an angle less than 45° to the axis of the roll and a second inclined retaining surface of revolution meeting the first at an angle greater than 90° and inclined from the roll axis at an angle of less than 45°, the second surface of revolution having a depression therein whereby the cross section of said second surface presents a generally concave aspect and the second surface extends outwardly from the juncture of the first and second surfaces a predetermined distance such that the longitudinal centroid of the conveyed work piece may be contained within the vertical extent of the first and second retaining surfaces while being advanced across a plurality of rolls comprising the conveyor.

3,677,395

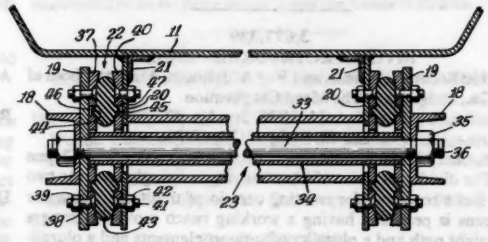
DRIVE STRUCTURE FOR USE WITH VIBRATORY DEVICES

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation

Filed Jan. 4, 1971, Ser. No. 103,382

Int. Cl. B65g *27/10*

U.S. Cl. 198—220 DA **8 Claims**



A vibratory device, such as for use in conveying pulverulent materials and the like. The device is powered by a reciprocat-

ing drive connected to a material-carrying member by a connecting structure. The connecting structure includes resilient force transfer means affording improved vibratory operation of the device.

3,677,396

STORAGE BOX FOR TAPE-CONTAINING CASSETTES AND THE LIKE

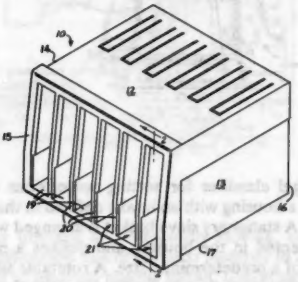
Theophiel Clement Josef Lodewijk Staar, Kraainem, Belgium, assignor to Staar, S.A., Brussels, Belgium

Filed Oct. 30, 1970, Ser. No. 85,430

Claims priority, application Belgium, March 16, 1970, 747,431

Int. Cl. B65d *39/00*

U.S. Cl. 206—1 R 13 Claims



A storage facility or box for storing sound tape cassettes having projecting finger elements which positively retain each cassette within a compartment when the cassette is inserted. Projecting finger elements also immobilize the cassette tape reel hubs and cassette pressure pads to prevent tape unwinding and cassette rattling.

3,677,397

PACKAGE FOR DOSAGE UNITS

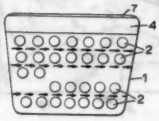
Robinson Beckham, Durham, England, assignor to B D H Pharmaceuticals Limited, Edinburgh, Scotland

Filed April 22, 1970, Ser. No. 30,822

Claims priority, application Great Britain, April 25, 1969, 21,181/69

Int. Cl. B65d *83/04*

U.S. Cl. 206—42 3 Claims



This invention relates to packages for dosage units comprising a sheet-like holder in which the dosage units are arranged in rows and a wallet in which the holder is removably enclosed, the wallet having an internal shape complementary to the external shape of the wallet such that the holder can be inserted in the wallet in only one position.

3,677,398

PACK FOR GAS MANTLES

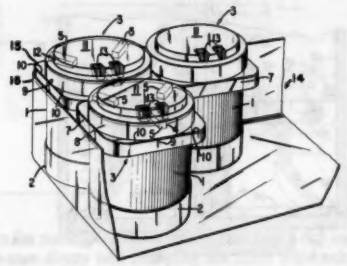
Claus Siegfried Nather, Berlin, Germany, assignor to Auergesellschaft GmbH, Berlin, Germany

Filed Oct. 5, 1970, Ser. No. 78,058

Claims priority, application Germany, Oct. 8, 1969, P 19 51 443.3

Int. Cl. B65d *25/00, 81/02*

U.S. Cl. 206—45.34 8 Claims



This invention relates to a pack for gas mantles, comprising an outer container having a transparent lid and arranged to hold a plurality of individual gas mantle holders, the holders also having transparent lids. The mantles are held feet uppermost in the individual holders so that their condition is immediately visible from the outside of the pack. The relative positions of the mantles, when loaded into the container, remain the same so that an easy inspection is possible and so that loading of the mantles into the holders and the holders into the container is relatively easy.

3,677,399

PUZZLE POSTCARD

Frank J. Tatar, Lakeview, N.Y., assignor to Comon Tatar Inc., Buffalo, N.Y.

Filed May 6, 1970, Ser. No. 35,096

Int. Cl. A63f *9/10*

U.S. Cl. 206—46 AM 4 Claims

A puzzle postcard including a tray member having a peripheral upstanding wall for containing a puzzle, a plastic envelope shrunk fit around the puzzle in the tray to securely hold it therein, and a postcard adhesively secured to the plastic envelope on the rear of the tray.

3,677,400

STORAGE UNIT FOR FLATWARE

Jerome B. Spier, Wilmette, Ill., assignor to M. I. Naken Company, Chicago, Ill.

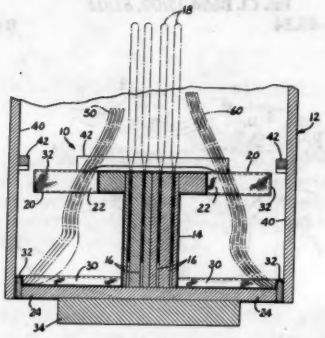
Filed May 28, 1970, Ser. No. 41,452

Int. Cl. B65d *47/20*

U.S. Cl. 206—75 2 Claims

A storage unit for flatware comprising a central body portion having slots therein for supporting a plurality of knives, or the like, in an upright position. Joined to the body portion, and extending outwardly from each side thereof, are upper and lower vertically spaced flatware support arms. The upper arms have a plurality of spaced channels for receiving the handles

of flatware such as spoons, forks and serving pieces, while the lower arms have recesses aligned with the channels of the upper arms for receiving an end of each piece of flatware engaged in the channels whereby the flatware is supported in a substantially upright position. The unit includes a cover which overlies the central body portion, the support arms, and the flatware stored in the unit.



3,677,401

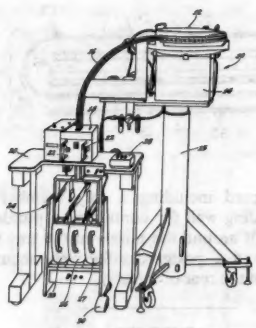
INTEGRATED CIRCUIT HANDLING SYSTEM

John J. Chaparro; Lowell V. Ellis, both of San Diego; Doyle W. Meanor, Lakeside; William D. Morton, Jr.; Bernd H. Richelmann, both of San Diego; George B. Ross, Mill Valley, and John E. Toth, San Diego, all of Calif., assignors to Delta Design, Inc., La Mesa, Calif.

Filed June 8, 1970, Ser. No. 44,401

Int. Cl. B07c 5/344

U.S. Cl. 209—73 **9 Claims**



A handling system, including an environmental system, for bringing a manufactured I.C. component into contact with a test contactor. Various parts, portions, and subcombinations of the system, including a hand feeder and orientor, an extension feeding conduit with an air pressure or friction wheel drive, a quick connect-disconnect output chute connector, a handling mechanism, a connector to attach a test contactor to a handling mechanism, a five place sorting apparatus, an environmental handling mechanism, and an insulated housing are detailed.

3,677,402

CENTRIFUGAL CLASSIFIER

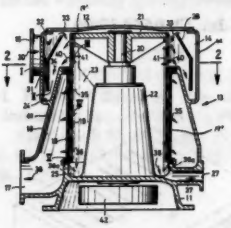
Emil Holz, Reutlingen-Betzingen, Germany, assignor to Hermann Finckh Metalltuch-und Maschinenfabrik, Reutlingen, Germany

Filed Sept. 17, 1970, Ser. No. 73,021

Claims priority, application Germany, Sept. 17, 1969, P 19 46 948.8

Int. Cl. B07b 1/24

U.S. Cl. 209—270 **5 Claims**



A centrifugal classifier for sorting suspensions of fibrous materials has a housing with an intake defined in the upper region thereof. A stationary sieve basket is arranged with its axis vertically oriented in the housing and defines a plurality of perforations of a predetermined size. A rotatable sieve basket is mounted adjacent and coaxial with respect to the stationary basket and extends beyond the upper edge of the stationary basket to the vicinity of the intake. A plurality of perforations are also defined in the rotatable basket, the perforations in the lower region being of a predetermined size larger than the perforations in the stationary basket and the perforations in the upper end being of a predetermined size larger than the perforations in the lower region of the rotatable basket. The suspension flows from the largest to the smallest perforations.

3,677,403

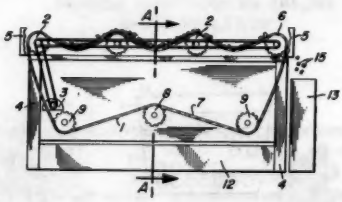
TUMBLE SCREEN CONVEYOR

Claude F. Young, Niagara Falls, and Richard O. De Weese, Tonawanda, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 5, 1969, Ser. No. 882,633

Int. Cl. B07b 1/10

U.S. Cl. 209—308 **6 Claims**



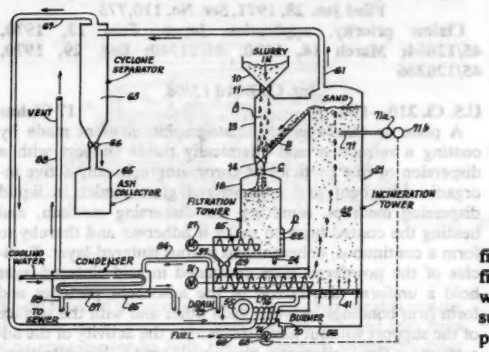
A tumble screen conveyor for use in imparting a gentle tumbling action to alloy sizes for removing fins or friable protrusions from their surfaces while simultaneously separating the desired alloy sizes from an admixture of fines of the alloy and/or from other material added to the alloy for insulation or quenching purposes.

3,677,404

MOVING BED FILTRATION METHOD

Herbert Kenneth Staffin, Colonia, N.J., assignor to Procedyne Corporation, New Brunswick, N.J.

Filed Nov. 25, 1970, Ser. No. 92,592
Int. Cl. B01d 23/10, 33/16
U.S. Cl. 210—67 4 Claims



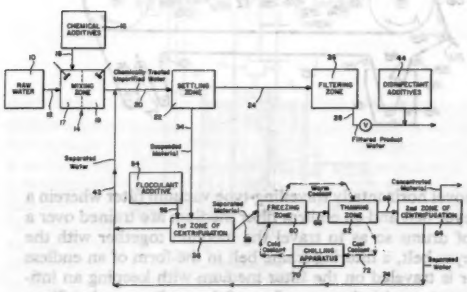
Apparatus utilizing a continuously-moving, continuously-regenerated filtration bed of granular material to filter materials that tend to obstruct porous media, operating in conjunction with a fluidized solids bed incinerator.

3,677,405

LIQUID AND SLUDGE TREATMENT

Frederick Walter Keith, Jr., Gladwyne, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sept. 25, 1970, Ser. No. 75,421
Int. Cl. B01d 21/26
U.S. Cl. 210—71 20 Claims



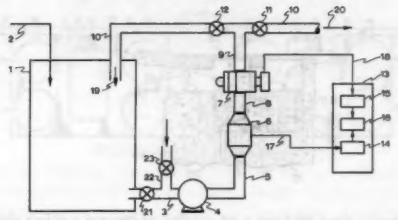
In water or liquid treatment, settled soft sludge is subjected to a first centrifugation to obtain cleaned water or liquid, and a concentrated aqueous sludge. This aqueous sludge is then continually fed through a freezing zone, and a thawing zone, after which it is subjected to a second centrifugation to obtain concentrated solids which are highly suitable for land fill, and further cleaned water or liquid which may be reprocessed.

3,677,406

FILTER AID SLURRY METERING PROCESS

James A. King, and David R. Maxam, both of Green River, Wyo., assignors to Stauffer Chemical Company, New York, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,587
Int. Cl. B01d 37/02
U.S. Cl. 210—75 3 Claims



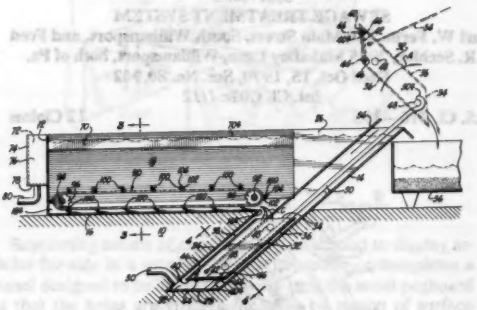
A system for measuring the solids content on a dry basis in a filter aid water slurry and pumping the filter aid back into a filter is described herein. The system circulates the filter aid water slurry through a density gauge and flowmeter to measure the dry weight of solids therein. Then, the slurry is pumped back into the filter for reuse.

3,677,407

METHOD AND APPARATUS FOR REMOVING SLUDGE FROM LIQUID

Robert L. McIlvaine, Glencoe, Ill., assignor to National Dust Collector Corporation, Skokie, Ill.

Filed Oct. 21, 1970, Ser. No. 82,644
Int. Cl. B01d 21/24
U.S. Cl. 210—83 11 Claims

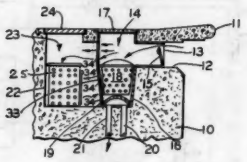


A method and apparatus for removing sludge from liquid utilizing a settling tank having a lower settling surface for collecting settled out sludge and a lower pit at one end of the surface for receiving the settled out material. A removable sludge collection bucket is normally disposed in the pit with the upper edges of the bucket below the level of the settling surface in order to receive collected sludge. Conveyor means is provided for moving collected sludge along the settling surface for discharge into the bucket positioned in the pit. The bucket includes a bottom having valve means therein operable to close the bucket during elevation from the pit out of the tank for the discharge of collected sludge and to open for admittance of liquid when the bucket is lowered back into a collecting position within the pit. Elevator means is provided for periodically elevating the bucket from the pit in order to discharge collected sludge externally of the sludge tank, and the bucket is elevated and discharged while the level of collected sludge is below the upper edge of the bucket, thus avoiding redispersion of the material into the liquid.

3,677,408
SWIMMING POOL WATER PURIFIER

Philip T. Dinizo, Jr., 1029 Mountain Avenue, Berkeley Heights, N.J.

Filed Jan. 21, 1971, Ser. No. 108,451
Int. Cl. E04h 3/20
U.S. Cl. 210—169 3 Claims

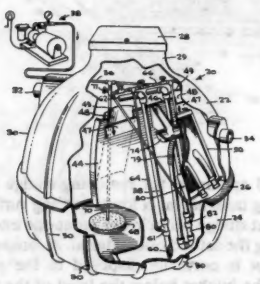


A swimming pool water purifier encased in the inner wall of a swimming pool, comprises a chamber located behind the wall of the pool and extending out of the pool wall in an opening. A skimmer is placed in this chamber and it has at least its rear wall portion perforated to permit the flow of water through it. Another chamber is located behind the first, and it has a coverable top opening. In the second chamber, a container is placed therein and it holds a solid purifying agent designed to liberate slowly a dissolved purifying agent into the water. The container may have a wall opening of contollable area for maintaining a predetermined concentration of purifying agent in the water.

3,677,409
SEWAGE TREATMENT SYSTEM

Carl W. Ferm, 950 Main Street, South Williamsport, and Fred R. Sechler, 2025 Mahaffey Lane, Williamsport, both of Pa.

Filed Oct. 15, 1970, Ser. No. 80,942
Int. Cl. C02c 1/12
U.S. Cl. 210—195 12 Claims



A sewage treatment system in which a bulbous shaped fiberglass tank is provided with an inlet and an outlet with an internal divider plate separating the tank into an aeration compartment and a settling compartment and a continuously activated air-nozzle sludge removing conduit for removing sludge from the bottom of the settling compartment and filtering means upstream of the outlet for preventing the discharge of solid particles with a back-wash liquid air nozzle beneath the liquid surface for continuously back-washing the filter means and for creating surface turbulence in the settling compartment for enhancing the operation of an air-nozzle operated skimmer means mounted adjacent the surface of liquid in the settling compartment.

3,677,410
SINTERED CHROMATOGRAPHIC PLATE AND METHOD FOR PRODUCING THE SAME

Tamotsu Okumura, and Tetsuro Kadono, both of Osaka Pref., Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

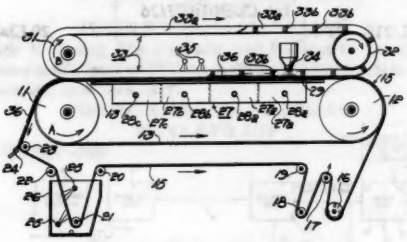
Filed Jan. 28, 1971, Ser. No. 110,773
Claims priority, application Japan, Feb. 13, 1970, 45/12864; March 14, 1970, 45/21740; Dec. 29, 1970, 45/126286
Int. Cl. B01d 15/08
U.S. Cl. 210—198 17 Claims

A plate or thin-layer chromatographic element made by coating a refractory and chemically stable support with a dispersion of fine particles of chromatographically-active inorganic adsorbent and a powdered glass binder in liquid dispersing medium, removing the dispersing medium, and heating the coated layer to make it adherent and thereby to form a continuous, coherent and porous sintered-layer. Particles of the powdered glass contained in said sintered-layer hold a uniform distribution of the adsorbent particles and form firm bondings between each other and with the surface of the support without any detriment to the activity of the adsorbent. The element can withstand "visualization" techniques including charring with corrosive agents such as sulfuric acid and cannot be deactivated or destroyed even after repeated treatments for regeneration.

3,677,411
HORIZONTALLY TRAVELLING-TYPE VACUUM FILTER

Eiichi Ishigaki, Sakaide, Japan, assignor to Ishigaki Kiko Co., Ltd., Sakaide, Japan

Filed Dec. 8, 1970, Ser. No. 96,054
Int. Cl. B01d 31/04
U.S. Cl. 210—393 7 Claims

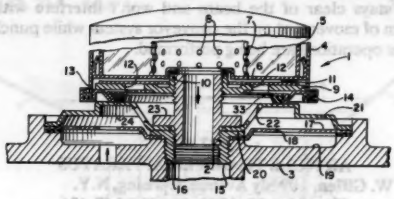


A novel horizontally travelling-type vacuum filter wherein a conveyor belt and an endless filter medium are trained over a pair of drums so as to travel the medium together with the conveyor belt, a filtering frame belt in the form of an endless ladder is traveled on the filter medium with keeping an intimate contact with the upper face of the medium so that filtering frames are formed on the medium and slurry is charged into each of said filtering frames whereby said slurry is filtered under vacuum after once filling each of the filtering frames, so that the decrease in vacuum degree due to the ill-balanced charge of slurry is fully avoided. Further, the endless filter medium once leaves the conveyor belt after the completion of filtering and separation of cakes on the medium and washing of the medium are carried out very easily and perfectly on the way of travel of the medium in the separated state of the medium from the conveyor belt.

3,677,412
OIL FILTER AND SEAL MEANS THEREFOR

Augustus S. Connor, Gastonia, N.C., assignor to Wix Corporation, Gastonia, N.C.

Filed Nov. 13, 1970, Ser. No. 89,199
Int. Cl. B01d 27/00
U.S. Cl. 210—440 3 Claims

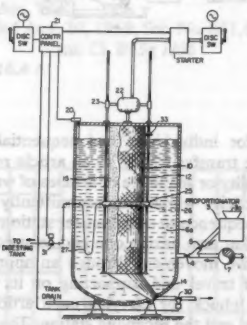


An oil filter of the screw-in throw-away type having unique seal means on an end wall thereof which is urged into tight sealing engagement by both the oil pressure within the filter and the engagement between the seal means and an associated structure against which the seal means seals when the filter is in use.

3,677,413
TERTIARY FILTERING ARRANGEMENT

Salem Boorujy, Chatham, N.J., assignor to Environmental Sciences, Inc., Berkeley Heights, N.J.

Division of Ser. No. 855,626, Sept. 5, 1969, Pat. No. 3,574,098. This application Dec. 28, 1970, Ser. No. 102,103
Int. Cl. B01d 39/00
U.S. Cl. 210—502 2 Claims



A method of preparing material for use in purifying water is disclosed. The material is advantageously processed from used, waste newsprint by grinding it until it will pass through a 70–80 mesh screen, cleaning the ground newsprint with solvent to remove residual oil, scorching the cleaned newsprint and then regrinding to a fineness that will pass through a 400-mesh screen. The material when added to water to be purified reduces the BOD content of the water being treated.

3,677,414
PRE-TIED NECKTIE RACK

Salvatore J. Rock, 1809 Brickell Avenue, Apt. 417, Miami, Fla.

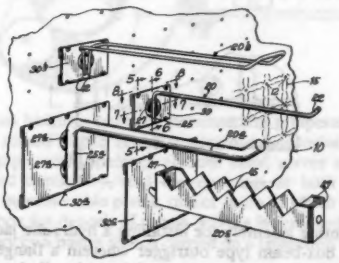
Filed Sept. 14, 1970, Ser. No. 71,646
Int. Cl. A47f 7/00
U.S. Cl. 211—13 1 Claim

This unique invention relates to a necktie rack adapted for pre-tied neckties.

3,677,415
CANTILEVER MERCHANDISE SUPPORT

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Co., Chicago, Ill.

Filed Sept. 17, 1970, Ser. No. 73,026
Int. Cl. A47f 7/00
U.S. Cl. 211—59 5 Claims



Supporting means of cantilever type designed to display articles for sale in a retail store. The invention contemplates a panel designed to be an improvement over the usual pegboard in that the holes are virtually invisible by reason of surface treatment of the panel and reduced size of the holes. The invention also contemplates special cantilever supporting bars having special attaching means locking them positively on an apertured panel, which may be that of the invention or a standard or other type of pegboard.

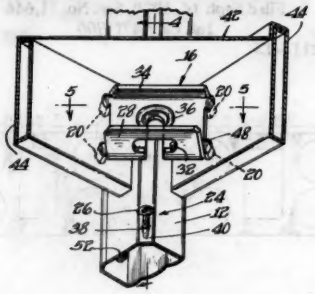
3,677,416
SHELVING STRUCTURE

Leonard A. Block, Kenosha, Wis., and William J. Dunn, Libertyville, Ill., assignors to Quaker Industries Inc., Antioch, Ill.

Filed June 1, 1970, Ser. No. 41,976
Int. Cl. A47f 5/00
U.S. Cl. 211—148 10 Claims

A shelving structure of the knock-down type which includes novel clip members for maintaining the individual shelf units and end standards in assembled relationship. Each of the clip members includes a body portion having tangs or prongs engageable with adjacent peripheral flanges on the individual shelf units and a slot opened at one edge of the body portion for receiving one of a plurality of fastening devices which is

preferably pre-connected to an associated end standard, the fastening device being thereafter further secured to the end



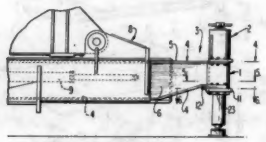
standard for drawing the shelf unit, clip member and end standard into a tight assembled relationship.

3,677,417

MOUNTING ASSEMBLY FOR INSTALLATION OF HYDRAULIC JACKS ON OUTRIGGER

Joseph H. Keller, Jr., Hagerstown, Md., and Russell L. Sterner, Greencastle, Pa., assignors to Grove Manufacturing Company, Shady Grove, Pa.

Filed Dec. 15, 1970, Ser. No. 98,394
Int. Cl. B66c *23/62*
U.S. Cl. 212—145 **3 Claims**



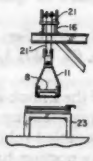
A mounting assembly for installing a hydraulic jack on the end of a box-beam type outrigger wherein a flanged collar, welded to the lower end portion of the jack cylinder, is bolted to flanges on the bottom wall of the outrigger, and a C-plate encircling the medial portion of the jack cylinder and bolted to flanges on the top wall of the outrigger thereby clamping the hydraulic jack in a substantially vertical position with respect to the outrigger.

3,677,418

POWER OPERATED I-BEAM ROTATOR

Walter B. Franzen, Rockford, Ill., assignor to W. A. Whitney Corp., Rockford, Ill.

Filed Aug. 3, 1970, Ser. No. 60,374
Int. Cl. B65g *7/00*
U.S. Cl. 214—1 QC **14 Claims**



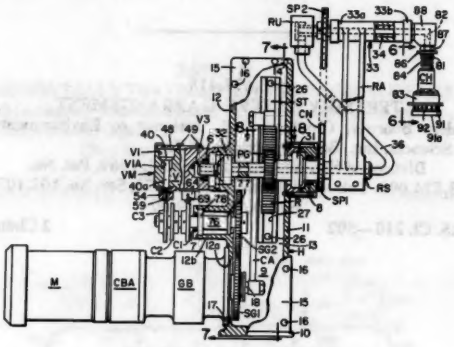
This power operated I-beam turner has endless chain loops in which to cradle the beam carried in a plurality of coaxially spaced pulleys that are profiled circumferentially for meshing engagement with chains to enable transmitting drive thereto, all at the same speed in either direction for a beam turning operation. The pulley blocks can be hoisted and lowered relative to a roller conveyor system on which the beam is movable endwise when placed thereon by the chain loops, spaces being provided in this conveyor system in which the chains can operate when free of the beam. A pair of forked, spring operated spreader arms are provided on each pulley block pivoted at one end on the block and having chain guides in the other end slidably engaging both sides of the chain loop on the inner side to spread it enough when it is not cradling a beam so that it stays clear of the beam and won't interfere with its freedom of movement on the conveyor system while punching or other operations are being performed.

3,677,419

ARTICLE TRANSFER APPARATUS

James W. Giffen, 109 Sly Avenue, Corning, N.Y.

Filed May 27, 1971, Ser. No. 147,426
Int. Cl. B65g *7/00*
U.S. Cl. 214—1 BV **14 Claims**



Apparatus for individually and sequentially transferring from an article transfer station to an article receiving station each of a plurality or sequence of articles of ware such as disk or dish-like articles which are intermittently delivered in a selected time sequence to said transfer station. The apparatus includes a rocker arm having one end secured to a rockshaft for reciprocative movement through an approximately 180° vertical arc of travel and supporting on its second end an aeriform fluid chuck for carrying each article between the transfer station and the receiving station. The output shaft of an electric motor is connected to the input shaft of a gear box through electrically actuated clutch-brake means which are selectively energized in synchronism with the delivery of each article to the transfer station and the transfer of each article to the receiving station. The output shaft of the gear box is connected to supply the reciprocative movement to the rockshaft and the rocker arm through a rack and pinion gear means. Valve means are also provided to selectively supply negative and, if desired, positive aeriform fluid to the chuck in a selected relationship with the reciprocative movement of the rockshaft and the rocker arm.

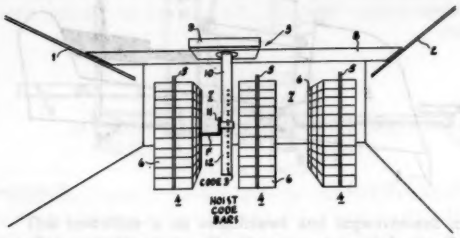
3,677,420
STORAGE AND RETRIEVAL SYSTEM WITH A MOTOR CURRENT SENSING TO DETECT OBSTRUCTIONS

Ronald K. Cotton, Rockledge, Fla., and Barney O. Rae, Shorewood, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Division of Ser. No. 670,094, Nov. 25, 1967, Pat. No. 3,537,602, which is a division of Ser. No. 498,326, Oct. 20, 1965, Pat. No. 3,504,245, Division of Ser. No. 7,889, Feb. 2, 1970, abandoned, which is a continuation of Ser. No. 198,210, Nov. 12, 1970. This application Feb. 2, 1970, Ser. No. 7,756

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 A **2 Claims**



An automatic warehouse system which allows an operator to sit at a fixed station and by placing punched cards into card readers and pressing a "GO" button can cause a fork to take one article from a pickup station into storage and to retrieve any other article from storage on its return trip and bring it to a point. Depending upon the information punched on the card, it can skip either the storage or the retrieval operation and perform the other or it can cause the fork to move an article from any rack in the warehouse to any other rack without returning to the pickup or set-down stations. In performing these movements in three dimensions, the system is provided with apparatus which recalculates the position of the fork every step of the way so as to eliminate any error that may occur, and stops, backs out or returns to the pickup station if it detects a full bin or other obstruction.

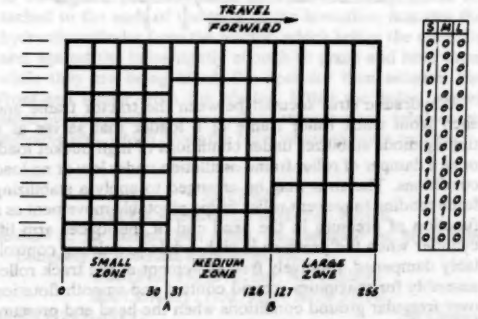
3,677,421
STORAGE COURIER BOUNDARY CONTROL SYSTEM

Paul M. Kintner, Bayside, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Aug. 20, 1969, Ser. No. 851,666

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 A **11 Claims**



In a warehouse having horizontal rows and vertical columns of bins in which packages are stored by a positive address code controlled courier (stacker crane), different size bins vary in height and are divided into zones of small, medium and large size bins. This system is arranged to check the size of the package. Subtraction of the read code from zone boundary codes provides information indicative of the zone of arrival. And comparison of the sizing information with the zone information will either allow the action to proceed or will return the package. Shelf error is handled by providing a code for each hoist address that defines the validity of the address for the several zones of different size bins. The integrated circuits send the package back to the pickup station if the validity code indicates that there is no shelf at the hoist address. In the event of a power failure, upon restoration, the integrated circuits automatically program for a large package sizing indication.

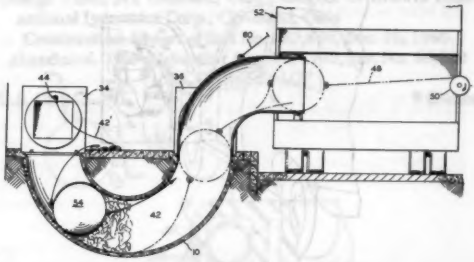
3,677,422
REFUSE HANDLING SYSTEM

Peter G. Meyers, Manchester; Eric C. Sweeney, Glastonbury, and Frederick W. Brunkhardt, South Glastonbury, all of Conn., assignors to Meyers Electrocooling Products, Inc., Manchester, Conn.

Filed March 26, 1971, Ser. No. 128,310

Int. Cl. B65g *67/06*

U.S. Cl. 214—17 D **11 Claims**



A refuse handling system is presented for temporary storage of solid refuse matter in underground depositories. A large, curved pipe, with openings at both ends, serves as the underground depository, and the openings at both ends are covered by removable plates, one or more of which also has a deposit box for deposit of refuse. Refuse is removed from the depository by a piston device carried on a collection vehicle.

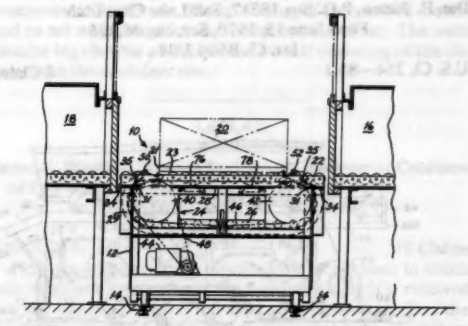
3,677,423
WORK TRANSFER APPARATUS

Warren H. Tollefsrud, and Edward W. Shriver, both of Toledo, Ohio, assignors to Midland-Ross Corporation, Toledo, Ohio

Filed Nov. 5, 1970, Ser. No. 87,061

Int. Cl. B65g *1/00*

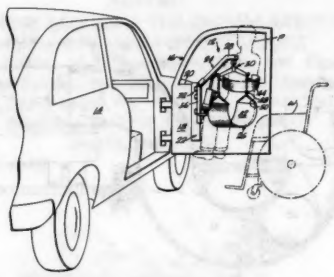
U.S. Cl. 214—18 R **3 Claims**



A car apparatus for transporting a workpiece carrier tray between separate work processing units and transferring the

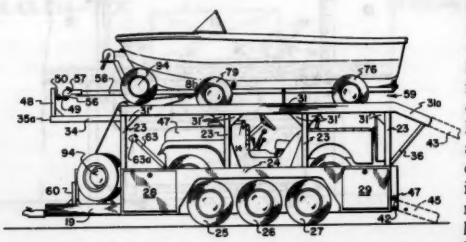
tray into and out of the units laterally with respect to the direction of car travel. The apparatus includes a push-pull means having a head assembly for engaging the tray. The head assembly comprises a frame slidable mounted upon a four wheeled carriage for relative movement between forward and rearward positions on the carriage. A hook member pivotally mounted on the frame is moved from a tray depositing mode to a tray withdrawing mode by shifting the frame into these alternate positions. The frame is shifted to the rearward position during a push stroke by the forward movement of the head assembly in combination with the resistance to this movement encountered when a bumper on the slidable frame engages a heavily laden tray to be charged into a processing unit. The frame is reset to its forward position during a pull stroke when a depending lug on the frame is pushed against a resiliently mounted abutment located on the car.

3,677,424
INVALID LIFTING APPARATUS
William G. Anderson, 1006 Brookwood Drive, Tallahassee, Fla.
Filed Aug. 6, 1970, Ser. No. 61,631
Int. Cl. B60p *1/48*
U.S. Cl. 214—77 **12 Claims**



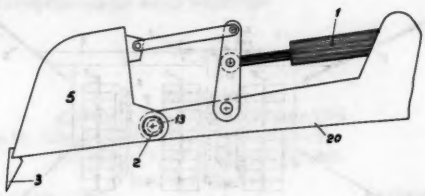
This invention pertains to invalid lifting apparatus having sling and derrick means for pendantly supporting and lifting an infirm or invalid person from one place to another place, as for example, for transferring the person between automobile, boat, airplane, wheel chair, bed, bathtub or the like. The lifting apparatus is suitable for multi-purpose application and may, if desired, include a plurality of base bracket means adapted for selective use in operatively supporting the derrick-sling construction of the apparatus on various conventional support structure such as an automobile door, a bedpost, wall or floor structure in a building or the like.

3,677,425
LAND AND WATER CRAFT TRAILER UNIT
Dan H. Patten, P.O. Box 18517, Salt Lake City, Utah
Filed June 15, 1970, Ser. No. 46,256
Int. Cl. B60p *3/08*
U.S. Cl. 214—85.1 **5 Claims**



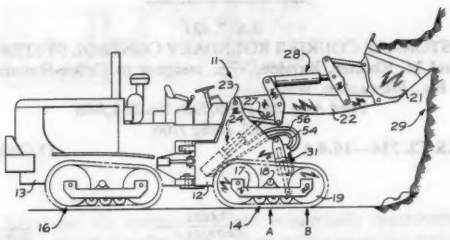
A trailer unit that will simultaneously haul land and water craft and wherein a supporting trailer for the water craft is adapted to be winched into place or with minor modifications to be used as a separate towing trailer.

3,677,426
HYDRAULICALLY OPERATED EQUIPMENT
Dieter G. Luck, 2 Aandblom Avenue, Kempton Park, Republic of South Africa
Filed Dec. 19, 1969, Ser. No. 886,667
Int. Cl. E02f *3/00*
U.S. Cl. 214—138 R **3 Claims**



Hydraulic equipment including at least one ancillary assembly in a pressure relief by-pass circuit arranged to impart an added and different motion to the normal motion of the implement and utilizing energy for this purpose which is normally dissipated as waste.

3,677,427
STABILIZING STRUT FOR TRACKED LOADER
Thomas E. Allen, Mustangtea, Okla., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed April 23, 1971, Ser. No. 136,868
Int. Cl. B66f *9/00*
U.S. Cl. 214—140 **11 Claims**

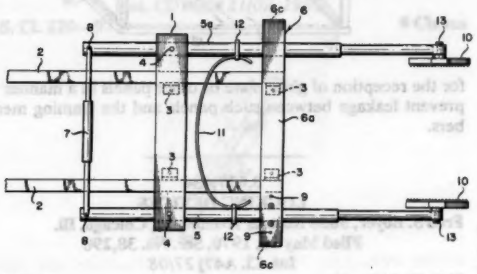


A hydraulic strut secured between the tractor frame and each front track roller frame of a loader that serves as a tipping mode stabilizer under conditions of high bucket load, or as a damper of roller frame oscillation under low or no load conditions. The strut may be arranged to apply a stabilizing force tending to prevent roller frame pivotable movement as a function of pressure in the head end of the loader arm lift cylinder when the pressure is high, while permitting controllably dampened, relatively free movement of the track roller assembly for maximum ground contact and smooth flotation over irregular ground conditions when the head end pressure is low. The strut may be further arranged such that it is rendered inoperative or insensitive to high pressures at the head end of the lift cylinder when the roller frame idler is located clockwise from its normal level state in order that the normal mobility of the loader is not detrimented.

3,677,428
BALE LIFTER

Wallace L. E. Mallett, Union Road, R.R. 3, Charlottetown, Prince Edward Island, Canada

Filed Oct. 20, 1970, Ser. No. 82,454
Int. Cl. B66c *1/44*
U.S. Cl. 214—147 G 5 Claims



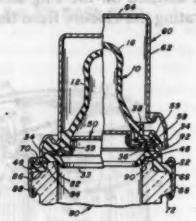
This invention is an attachment and improvement to be used in combination with the conventional hydraulically operated front-end loaders commonly used attached to farm-tractors, and provides new means for handling, lifting and moving bales of hay, cotton, or any other produce or material capable of being handled in bale form, and means for handling relatively larger numbers of bales than any previous art. It is therefore a labor and time saver and of general economic benefit. It consists of a combination of an oblong rectangular metal plate attached by removable means to the arms of the front-end loader, having two metal arms disposed over the metal plate and attached by means thereto, and extending over and behind the metal plate, where a hydraulic cylinder; connected by conventional means to the hydraulic pump system on the tractor; is disposed between and attached to the arms, which also extend over and in front of the metal plate, to, through and in front of, an oblong open-sided box-like receptacle, which is also attached by removable means to the arms of the front-end loader. The box-like receptacle protects and supports the two arms of the invention and holds one of them by means in various stationary positions, allowing the other to move within the box-like receptacle, when actuated by the hydraulic cylinder. An expansion spring holds the arms of the invention apart. The said arms each have a corrugated metal plate, disposed and adapted to be attached by removable means to the inner side of their ends. The combination is attached to the front-end loader arms. The operator on a tractor moves the tractor toward the bales of produce or material to be moved; positions same between the metal plates attached to the ends of the arms of the invention; actuates the hydraulic cylinder from the tractor, which brings the movable arm against the bales tightly enough to grasp and hold them while they are being lifted; the operator then actuates the front-end loader from the tractor, lifting the bales, moves same over a vehicle or over a pile or storage place; releases the movable arm, which drops the bales where they are required.

3,677,429
NIPPLE ASSEMBLY AND PACKAGE

Robert L. La Barge, Ben Avon, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 16, 1971, Ser. No. 115,597
Int. Cl. A61J *11/02, 9/00;* B65d *51/16*
U.S. Cl. 215—11 C 4 Claims

An elastic dispensing nipple is provided which has an inwardly open annular recess in its base and a sealing disc disposed in the nipple base with the peripheral edge portion of the disc seated in the recess, the recess having a plurality of radially extending ribs on the undersurface of its top wall and on the upper surface of its bottom wall, and the disc having a plurality of radial ribs and a circumferential rib in its peripheral edge portion. An assembly of such nipple and disc

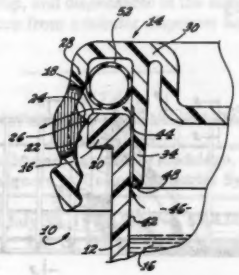


is adapted to be sealed on a container entrance mouth with a shroud thereover to seal the contents in a container, and to dispense the contents of the container through the nipple after the shroud has been removed.

3,677,430
SELF-CENTERING AND VENTING CLOSURE

George Yates, Jr., Glendale, Calif., assignor to Growth International Industries Corp., Cleveland, Ohio

Continuation-in-part of Ser. No. 883,694, Dec. 10, 1969, abandoned. This application Aug. 24, 1970, Ser. No. 66,529
Int. Cl. B65d *41/22*
U.S. Cl. 215—41 9 Claims



A closure having an outer annular leg to engage a bead about the rim of an open container body, an annular flexible sealing leg having spaced recesses to allow compressed gas to escape during the engagement of the closure to the container body and to provide a seal when the engagement is complete, an inner annular leg and a generally flat center portion to compensate for stresses during cooling of the molded closure and to act as a receptacle for a stacked container. The outer annular leg also has an end recess for self centering of the closure upon the container rim.

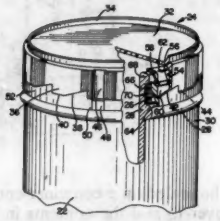
3,677,431
CONTAINER CLOSURE

James E. Westfall, Western Springs, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed April 6, 1970, Ser. No. 25,787
Int. Cl. B65d *41/04*
U.S. Cl. 215—43 16 Claims

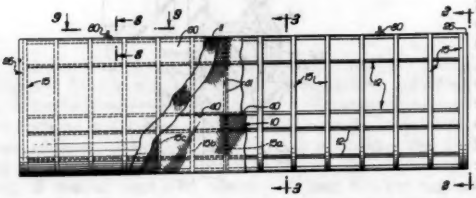
A closure and finish ring assembly for a container in which both the closure proper and the finish ring which is received over the container and at the same time in turn receives the closure, may be formed as a unit and installed on the container by a press-on action without intentional rotation. After the ring and closure are in place on the container, the closure is removed by rotation thereof after releasing a lock provided to

provide the container with a so-called tamper proof feature. In one form, the closure is cammed axially upwardly at the same time the closure skirt is deflected slightly outwardly for release from the finish ring. In another embodiment, complete or partial threads are formed on the ring associated with the container for separating the closure from the ring as the closure is



moved axially. The closure and ring may be formed as a single unit by double injection molding, with the interface between the ring and closure forming, in effect, part of the mold for formation of the associated part. Molding materials and processing steps are selected so that the ring and closure do not bond to each other during formation.

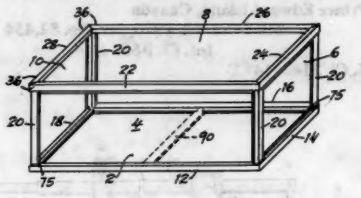
3,677,432
COMPOSITE STRUCTURE
Charles E. Kaempen, 3202 Larkstone Drive, Orange, Calif.
Filed May 2, 1969, Ser. No. 821,327
Int. Cl. B32b *3/04*
U.S. Cl. 220—3 **21 Claims**



A structure comprising flattened expanded metal, or the like, having a sealed fabric of nylon or glass cloth bonded thereto by an intervening polyurethane elastomeric plastic. The structure disclosed is a storage tank having a framework, including circumferentially spaced longerons and longitudinally spaced rings secured to the longerons, with the sealed fabric bonded by the elastomeric plastic to the expanded metal and the surfaces of the framework which is engages. End portions of the framework have flattened expanded metals secured thereto and to which the sealed fabric is bonded by the polyurethane elastomeric plastic. A band of continuous filament glass may be wound around and bonded to the fabric.

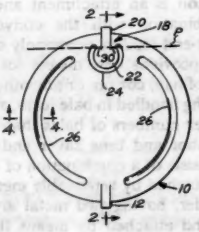
3,677,433
CORNER CONSTRUCTION FOR AQUARIUM OR THE LIKE
David R. Collins, R.D. 1, Newtown, Pa.
Filed April 3, 1970, Ser. No. 25,429
Int. Cl. B65d *7/32;* **A01k** *64/00;* **F16b** *9/02*
U.S. Cl. 220—4 R **7 Claims**

A three-dimensional framing assembly adapted for use in the construction of aquariums, show cases, tables and other structures wherein three intersecting members, which may be formed of extruded metal strips, are assembled to form a corner construction that is neat in appearance and strongly connected. The assembly in some instances may be designed



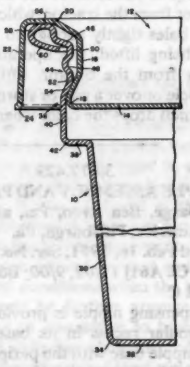
for the reception of glass, slate or other panels in a manner to prevent leakage between such panels and the framing members.

3,677,434
LOCKING DEVICES
Fred S. Boyer, 5638 Kostner Avenue, N., Chicago, Ill.
Filed May 18, 1970, Ser. No. 38,290
Int. Cl. A47J *27/08*
U.S. Cl. 220—59 **22 Claims**



Locking devices for sheet metal plugs and other hole closures, include at least one locking member which is hingedly connected to the disc and which includes a tab portion, which when struck an impacting blow, causes the locking member to rotate about its hinge into a position where the closure is locked in the hole.

3,677,435
CONTAINER
Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.
Continuation-in-part of Ser. No. 875,605, Oct. 30, 1969, abandoned. This application July 6, 1970, Ser. No. 52,587
Int. Cl. B65d *43/10, 21/02, 51/16*
U.S. Cl. 220—60 R **5 Claims**



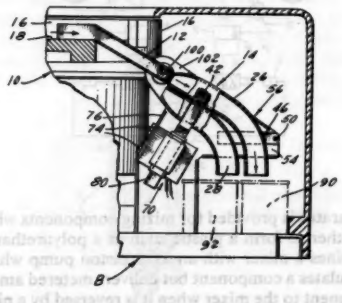
A container with a combination lid retaining bead and nest-

ing ring disposed at the top of the container side wall with the bead being axially interrupted to facilitate positioning of the lid on the rim without permanently distorting the lid.

3,677,436
DRUM PALLET
Gunnar H. Danielson, Minneapolis, Minn., assignor to Valley Craft Products, Inc., Lake City, Minn.
Filed Dec. 4, 1969, Ser. No. 882,063
Int. Cl. B65d *21/02, 19/02*
U.S. Cl. 220—97 B **8 Claims**

Handling of drums, barrels and similar contains is facilitated by the provision of pallet means thereon comprising at least a pair of runners temporarily or permanently attached to a portion of a drum, usually one of the circular ends, cleats attached to the runners and means securing the runners to the drum or container. The cleats may be straight or bevelled and are positioned on the runners to serve the dual purpose of providing a ground engaging means when the ground is the support and by providing a centering action when another drum is the support. External fasteners or weld means serve to secure the pallet means to the lower rim or chime of the drum.

3,677,437
PILL COUNTING APPARATUS HAVING CHUTE SHIFTING ON PREDETERMINED COUNT
John S. Haigler, 9581 Calendula Avenue, Westminster, Calif.
Filed March 27, 1970, Ser. No. 23,244
Int. Cl. G07f *11/00*
U.S. Cl. 221—7 **6 Claims**

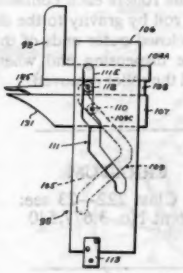


Apparatus for counting and dispensing articles such as pills, having a vibratory device for automatically separating, spacing and feeding the separated, spaced and counted pills to a chute. A photoelectric cell and a light source function to energize a solenoid of a counter as the pills slide down the chute and interrupt a beam of light between the light source and the photoelectric cell. A lower part of the chute is divided and pivoted and is actuated from the normal position whereat the counted pills are conveyed to a container therefor to a position whereat the remaining pills are conveyed to a container for the oversupply, excess, surplus, remainder or extra pills which can then be returned to a large storage container or to the hopper of the separating and feeding device.

3,677,438
DISPENSING LINER AND PAD FOR UTENSILS
Joseph Alexander Esposito, 1113 Hollen Road, Baltimore, Md.
Filed Feb. 26, 1970, Ser. No. 14,363
Int. Cl. B65h *1/00*
U.S. Cl. 221—63 **4 Claims**

A tube-dispensable combination expanding pan-liner and hotpad for pans and the like, comprising a metal foil disc having the periphery folded inward, the disc folded inward over the inwardly folded periphery about a diameter of the disc to semi-disc configuration, and the semi-disc rolled into a coiled funnel configuration approximating the overall shape of a conical drinking cup, and dispensable in the same manner as a conical drinking cup from a tubular dispenser having an internal constriction.

3,677,439
CARTON DISPENSERS HAVING PLURAL CAM DENESTERS
Delbert B. Bosworth, and Ernest E. Goodridge, both of Portland, Maine, assignors to United Industrial Syndicate, Inc., Portland, Maine
Filed July 30, 1970, Ser. No. 59,424
Int. Cl. B65g *59/10*
U.S. Cl. 221—251 **23 Claims**



Dispensers are disclosed for a stack of nested articles of a type having marginal portions by which they may be supported and which are spaced so that the ends of supported members having cam surfaces may be inserted between them to force them apart. The dispensers are discussed with particular reference to open egg cartons with the marginal portions being the ends of the hinge connection between their covers and bottoms. The dispensers have first and second members at both of its sides and means, in preferred embodiments vertically reciprocable cam plates, operable to actuate the members so that the ends of the first and second members al-

ternately support the stack of articles. The ends of the second members are spaced from the ends of the first members by a distance such that the ends of the second members may be entered between the marginal portions of two articles when the stack is supported by the ends of the first members. The second member ends have cam surfaces operable, in one embodiment, to free the lowermost article, as they move into article supporting positions, if the lowermost article adheres to the bottom of the stack when the first member ends are retracted. In a preferred embodiment, the first member ends include cam surfaces and the second member ends are operative at least to increase the distance between the articles between which they are entered so that the first member ends may also be entered therebetween as the first member ends approach their stack supporting positions so that both members cooperate in ejecting articles. The member operating means provide for the operative position of the first member ends following the movement of the second member ends into their operative positions thereby to cooperate therewith in article ejection. Desirably, the dispenser has resiliently yieldable fingers arranged to receive and support articles whether freed by the second members or by the combined effort of the two sets of members and then be forced therefrom by the cam surfaces of the first members after predetermined travel.

3,677,440

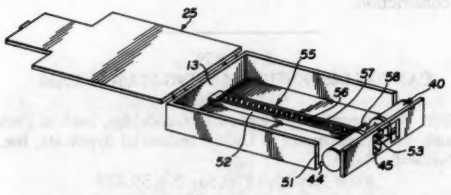
RECEPTACLE FOR DISPENSING ROLLABLE PILL CONTAINERS

James A. Davis, 574 Kieffer Street, Wooster, Ohio

Filed Dec. 7, 1970, Ser. No. 95,474

Int. Cl. B65g *59/06*

U.S. Cl. 221—279 **9 Claims**



A pill dispenser having a receptacle for carrying a plurality of sealed pill or capsule rollers each containing one or more doses and adapted to roll by gravity to the dispensing end of the receptacle. Both closed outer ends of the rollers are exposed to view at the dispensing end where they may be separately opened and the roller removed.

ERRATUM

For Class 222—23 see:
Patent No. 3,677,540

3,677,441

MULTIPLE AEROSOL DISPENSER

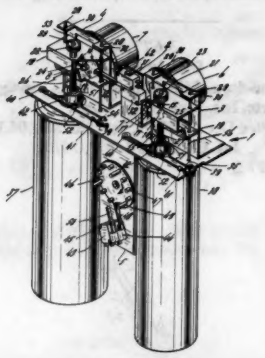
Dalbro R. Nixon, Jr., Chesapeake; David J. McIlhenny, Suffolk, and Marvin L. Harrell, Portsmouth, all of Va., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Continuation-in-part of Ser. No. 71,055, Sept. 10, 1970, Pat. No. 3,647,116. This application Nov. 16, 1970, Ser. No. 89,601

Int. Cl. B67d *5/08*

U.S. Cl. 222—63 **4 Claims**

Aerosol bombs of the type having a cylindrical body portion and a neck dispensing portion with a collar and a dispensing valve, particularly a mounting bracket and plural dispensers for mounting two or more aerosol bombs and a motor ac-



tivated dispensing mechanism which depresses the bomb valves, so as to discharge the bombs simultaneously or sequentially at pre-selected time intervals.

3,677,442

MACHINE FOR DELIVERING MULTI-COMPONENT PLASTICS MIXTURE

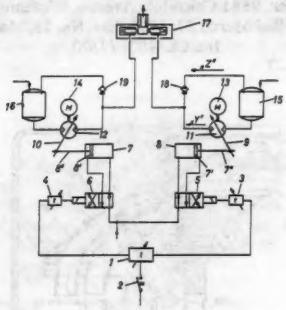
Joachim Ruhnau, Auf der Heide 11, 3001 Isernhagen Hohenhorster Baurschaft, Germany

Filed Feb. 18, 1970, Ser. No. 12,340

Claims priority, application Germany, Feb. 19, 1969, P 19 08 210.1

Int. Cl. B67d *5/08*

U.S. Cl. 222—70 **2 Claims**



An apparatus is provided for mixing components which will react together to form a plastic such as a polyurethane foam that combines a mixer with an axial piston pump which normally circulates a component but delivers metered amounts of the component to the mixer when it is reversed by a piston actuated in an air cylinder a predetermined interval of time by a valve controlled by an electric timer.

3,677,443

APPARATUS FOR DISPENSING FROZEN COMESTIBLES

Yechiel Smadar, New York, and Abraham H. Goodman, Great Neck, both of N.Y., assignors to DCA Food Industries, Inc., New York, N.Y.

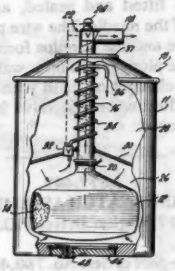
Filed July 14, 1969, Ser. No. 841,193

Int. Cl. B65d *35/22;* **B67d** *5/62*

U.S. Cl. 222—94 **7 Claims**

A non-dairy food product having the texture and eating characteristics of soft-serve ice cream is prepared from a com-

position of matter comprising a sweetener, hydrolyzed starch conversion products, microcrystalline cellulose, hydrogenated shortening, caseinate and water. The product, as well as other food products, can be dispensed from a self-refrigerating dispenser containing a refrigerant under pressure surrounding



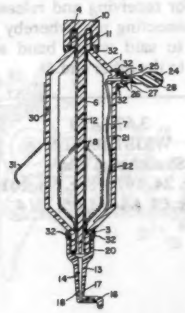
a flexible product bag. Actuation of control means on the dispenser permits a portion of the refrigerant to expand thereby cooling the product while the unexpanded portion of the refrigerant squeezes the product bag causing the product to flow.

3,677,444

MICROPUMP

Edward W. Merrill, Cambridge, Mass., assignor to Hans H. Estin, Leonard W. Cronkhite, Jr. & William W. Wolbach, Trustees of the Charles River Foundation, Boston, Mass.

Filed March 6, 1970, Ser. No. 17,169
Int. Cl. B67d *5/40*
U.S. Cl. 222—135 **3 Claims**



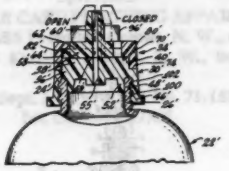
A pump for delivering liquid at a relatively constant rate from a chamber having a compliant membrane wall which exerts a substantially constant resistive force when expanded under a pressure within the range of between zero and atmospheric and within the mechanical limits imposed on it. The outside surface of the membrane is located in a second chamber wherein the pressure is increased to atmospheric by diffusing gas through an elastomeric diffusion membrane. The pump is especially adapted for delivering microquantities of liquid at a constant rate for long periods.

3,677,445

SPOUT-TYPE SAFETY DISPENSING CAP

Robert P. Linkletter, 875 Comstock Ave., Los Angeles, Calif.

Filed Oct. 30, 1970, Ser. No. 85,378
Int. Cl. B67d *5/32*
U.S. Cl. 222—153 **17 Claims**



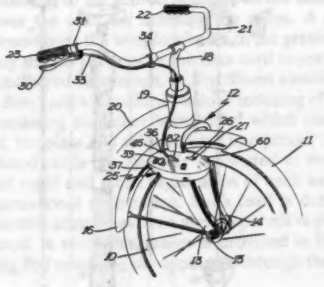
A safety dispensing cap for liquid containers such as bottles and cans, having a spout-type dispensing valve mounted in a channel in a closure member secured to the container. The valve is movable between an open position and a closed position, and a rotatable safety ring encircles a portion of the closure member and must be precisely aligned in a preselected position relative to the valve before the valve can be moved from the closed position to the open position. In one embodiment, the valve has a base which is rotatable within the channel and in a second embodiment, the base is slidable within the channel, the base being movable in both embodiments only when a recess in the ring is properly aligned with an end abutment on the base.

3,677,446

LIQUID GUN FOR USE ON WHEELED VEHICLE

Reynolds W. Guyer, Jr., Mendota Heights; Norton M. Cross, Jr., White Bear Lake; Barbara Allen Griggs, St. Paul, and Martin A. Lundquist, Plymouth, all of Minn., assignors to Reynolds W. Guyer, Jr., Winsor Concepts, Minneapolis, Minn.

Filed Aug. 4, 1969, Ser. No. 847,034
Int. Cl. B05b *9/06*
U.S. Cl. 222—177 **7 Claims**



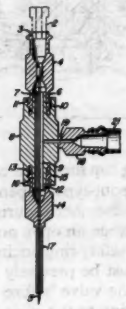
A water gun for use on a bicycle or tricycle vehicle in which a pump driven by a roller engageable with a wheel of the vehicle drives a pump to pump water from a container through a nozzle. A cable controlled by a handle secured to the handle bar of the vehicle is used to move the roller into engagement with the wheel when it is desired to squirt water. A clacker may also be actuated by the roller to produce a sound simulating that of a machine gun.

3,677,447

INTERCHANGEABLE TIP FOR DISCRETE DROPPING APPARATUS

John C. Rentz, Joppa, Md., assignor to The United States of America as represented by the Secretary of the Army

Filed March 29, 1971, Ser. No. 128,842
Int. Cl. B67d *5/54*
U.S. Cl. 222—193 8 Claims



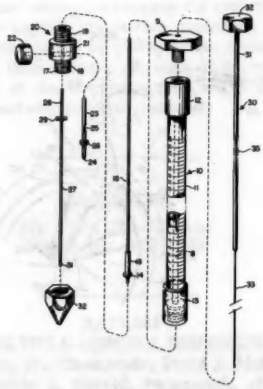
An apparatus and method for dispensing accurate monodispersed aerosol droplets wherein a syringe, a dropping needle, a conduit needle, and a fluid supply are arranged in a combination to form a droplet of liquid on the tip of the dropping needle from the syringe and to blow the droplet off of the dropping needle to a receiver means by the fluid supply.

3,677,448

SYRINGE WITH WIRE PLUNGER FOR DISPENSING INFINITESIMALLY SMALL, ACCURATELY MEASURED QUANTITIES OF FLUID

Rano J. Harris, Sr., and Rano J. Harris, Jr., both of Baton Rouge, La., assignors to Precision Sampling Corporation

Filed Jan. 29, 1971, Ser. No. 110,900
Int. Cl. G01f *11/00*
U.S. Cl. 222—387 8 Claims



A syringe for use in dispensing infinitesimally small, accurately measured quantities of fluid. The syringe is comprised generally of a tubular body, a needle and lateral vent-valve assembly mounted in the forward end of the tubular body. The needle and lateral vent-valve assembly comprises a resilient tubular body, a tubular plunger guide mounted at one side thereof and within the axial opening of the tubular body, a needle mounted on the resilient tubular body at the forward or opposite side of the tubular guide and an on-off valved lateral vent communicated to the bores through the hollow needle, the resilient tubular member and the plunger guide. The plunger assembly includes a telescoping tubular member which is reciprocably mounted upon the plunger guide, and a wire plunger associated therewith which extends through the bore of the plunger guide, the resilient tubular member with which it is snugly fitted and sealed, and is loosely fitted through the bore of the needle. The wire plunger traverses the length of the needle and the annulus formed between the external surface of the plunger and inter wall surface of the needle can be readily cleaned or filled with an accurately measured quantity of fluid when the valve is open and injected when the valve is closed.

3,677,449

WRIST WATCH ASSEMBLY

Bill D. Williams, 612 Marion Drive, P.O. Box 243, Madison, Ala.

Continuation-in-part of Ser. No. 780,407, Dec. 2, 1968, abandoned. This application March 23, 1970, Ser. No. 21,865
Int. Cl. A44c *5/00*
U.S. Cl. 224—4 E 2 Claims

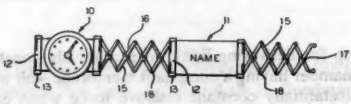
A one piece resilient watch band having at one end an opening therethrough for hingedly connecting that end to the watch by means of one of the usual watch band connecting pins, and a C-shaped slot near the other end opening outwardly of the band for receiving and releasably holding the other watch band connecting pin, whereby a watch may be hingedly connected to said watch band at one end, and releasably connected to the other end.

3,677,450

WRIST BANDS

Jo Hodgson, Route 2, Shullsburg, Wis.

Filed Dec. 24, 1970, Ser. No. 101,331
Int. Cl. A44c *5/06, 5/14*
U.S. Cl. 224—4 E 7 Claims



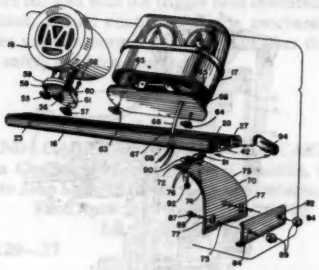
An expandable watch band has an identification plate therein for receiving identification, allergy, or medical information thereon. The ends of the bracelet have disconnect features which enable an easy removal of the expandable bracelet for engraving the plate.

3,677,451

SUPPORTING BAR ASSEMBLY FOR VEHICLE

Oliver John Burland, 214 Rugley Road, Western Springs, Ill.

Filed Dec. 22, 1969, Ser. No. 886,829
Int. Cl. B60r 11/00
U.S. Cl. 224—47.1 F 4 Claims



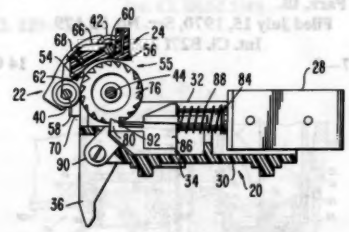
A supporting bar structure for a vehicle includes an elongated bar and a pair of end brackets for securing the bar above the vehicle roof. The bar includes substantially planar top and bottom surfaces, and at least one longitudinally extending T-shaped slot is provided in each of the surfaces. A pair of T-fittings is slidably received by the bottom slot, and a bracket is adjustably secured adjacent each end of the bar by a bolt extending through the bracket into one of the T-fittings to tighten the T-fitting and the bracket against the bottom wall of the bar. The brackets are equipped with clamping means for anchoring the bar to the vehicle. T-fittings can be received by the slot in the upper surface of the bar for securing vehicle warning lights, sirens, and the like to the support bar.

3,677,452

INTERMITTENT WEB ADVANCING DEVICE

Harry L. Wallace, Garden City, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 28, 1970, Ser. No. 101,985
Int. Cl. B26f 3/02
U.S. Cl. 225—11 21 Claims



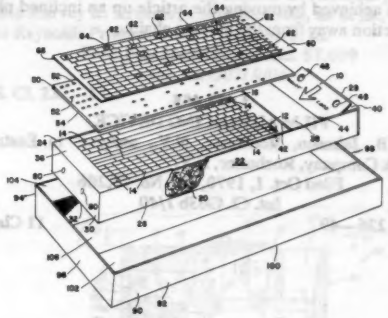
A pawl and ratchet web drive device is provided, the pawl being formed on the free end of a resilient furcation of a reciprocable, bifurcated plunger, the free end of the other furcation forming a back-up stop abuttable by the pawl to render it unyieldable when it is moved effectively against the trailing face of a tooth of a ratchet wheel to incrementally rotate the same, the pawl being deflectible laterally when it is retracted across the leading face of a tooth for performing a succeeding incremental movement. The device further includes a fixed detent interengageable with the teeth to prevent return rotation of the ratchet wheel and being deflectible out of its normal position when the wheel is moved by the pawl. Preferably, the parts of the ratchet mechanism are composed of hardened, molded plastic material having the inherent resiliency for performing the aforementioned deflections.

3,677,453

PORTABLE CARD PUNCHING APPARATUS

Miles E. Parks, 1055 Parmelee Avenue, N. W., and Robert J. Scranton, 1830 Kenowa Avenue, S. W., both of Grand Rapids, Mich.

Filed Sept. 10, 1970, Ser. No. 71,159
Int. Cl. G06k 21/06
U.S. Cl. 225—93 19 Claims



a plurality of printed information cards identifying informational units are positionable over a data processing card and each includes a slotted portion corresponding to one of the rows or columns on the card to facilitate registration of information on the data card by a conventional stylus. The slotted portion of the printed cards are staggered with respect to each other so that as each printed card is positioned over the data card for recording, a different row or column of the data card is exposed. A plastic template having a plurality of perforations corresponding to the scored portions on the data card is positioned over the card for indexing the stylus. A selector card is positioned over the template beneath the printed cards and selectively shields portions of the data card to prevent accidental or undesired recordings. A Styrofoam cleaning base supports the data card to facilitate positive indexing of the stylus and an enclosing container is provided which also aligns the data card, template and selector card into proper registration. The printed cards are hingedly connected to the enclosure to permit rapid and facile registration of each individual card for informational registration. Each card is detachable from the apparatus after it has been used to permit registration of the next card. A reversible mailer is provided to facilitate ease in sending and returning the apparatus through the mails.

3,677,454

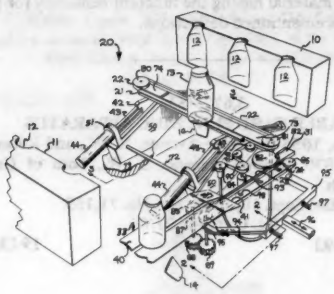
APPARATUS FOR TRIMMING BLOWN PLASTIC ARTICLES

Joseph E. Boyer, Warson Woods, Mo., assignor to Owens-Illinois, Inc.

Filed June 3, 1970, Ser. No. 42,929
Int. Cl. B26f 3/02
U.S. Cl. 225—99 8 Claims

The present invention relates to an apparatus for making blown plastic articles such as bottles. A coacting chain and bar mechanism is positioned below the dies of a blow molding

machine to facilitate removal of the blown article by grasping the tail portion thereof. Separation of the tail from the blown



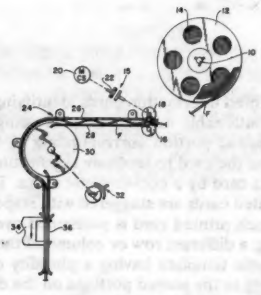
article is achieved by moving the article up an inclined plane in a direction away from the moving chain.

3,677,455

FILM ADVANCING DEVICE

Robert B. Johnson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 1, 1970, Ser. No. 77,206
Int. Cl. G03b 1/40
U.S. Cl. 226—49 **11 Claims**



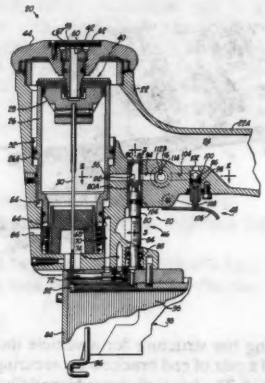
A motion picture projector having selectively operable means for intermittently moving film through a projection gate in either forward or reverse directions and for continuously moving film through the gate for rewind operation includes a device for advancing film between a supply roll and the gate in forward projection, reverse projection and rewind modes of operation of the projector. Film is advanced by the device through a channel defined by at least one rotatable roller and wall means spaced apart sufficiently to permit an excess of film to build up ahead of the gate. The channel defining means may be coated with a high friction material so that during forward projection when film is pushed into the channel from the supply roll by a tendency drive mechanism, contact between the film and the high friction material coating prevents movement of more film into the channel by the tendency drive than is withdrawn from the other end of the channel by the intermittent film moving means. During reverse projection operation of the projector, contact of the film with the high friction material attenuates the force applied to the film by the tendency drive and prevents that force from reaching the film in the gate. The force attenuating effect is reduced during threading and rewind operation by permitting the roller to be rotated by the film passing thereover.

3,677,456

SAFETY FOR FASTENER DRIVING TOOL

Howard B. Ramspeck, Chicago, and Allen R. Obergfell, Park Ridge, both of Ill., assignors to Fastener Corporation, Franklin Park, Ill.

Filed July 15, 1970, Ser. No. 55,178
Int. Cl. B27f 7/22
U.S. Cl. 227—8 **19 Claims**



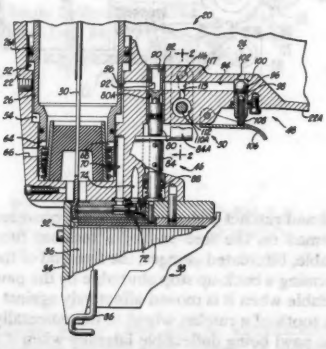
A pneumatic fastener driving tool includes a safety arrangement that requires the tool to be placed against a workpiece before a manual trigger valve is operated in order to permit the tool to fire. Once the tool is placed against the workpiece the safety arrangement prevents "touch" firing by moving the tool toward and away from the workpiece. In two embodiments, the safety arrangement includes a piston valve which is fluid operated to close off a control line to the main valve of the tool whenever the trigger is operated before the tool is placed against a workpiece and when an attempt is made to "touch" fire the tool with the trigger held operated. In a third embodiment, metering orifices in a valve actuated by moving the tool against a workpiece prevent repeated "touch" operation of the tool.

3,677,457

SAFETY FOR FASTENER DRIVING TOOL

Howard B. Ramspeck, Chicago, and Raymond F. Novak, Schiller Park, both of Ill., assignors to Fastener Corporation, Franklin Park, Ill.

Filed July 15, 1970, Ser. No. 55,179
Int. Cl. B27f 7/22
U.S. Cl. 227—8 **14 Claims**



A pneumatic fastener driving tool includes a safety arrangement that requires the tool to be placed against a workpiece

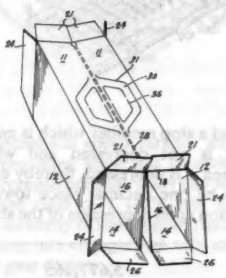
before a manual trigger valve is operated in order to permit the tool to fire. Once the tool is placed against the workpiece the safety arrangement prevents "touch" firing by moving the tool toward and away from the workpiece. In one embodiment, the safety arrangement includes a fluid controlled piston which is operated to mechanically latch a workpiece actuated safety in its normal position to prevent tool operation whenever the trigger is operated before the tool is placed against a workpiece and whenever an attempt is made to "-touch" fire the tool with the trigger held operated. In a second embodiment, a fluid controlled piston mechanically latches the trigger valve in normal position until after the workpiece actuated safety has been operated.

3,677,458

END LOADING TWIN BEVERAGE CARTON

Dickinson Gosling, Victoria, British Columbia, Canada, assignor to John Labatt Limited, London, Ontario, Canada

Filed April 2, 1970, Ser. No. 25,086
Int. Cl. B65d 5/46
U.S. Cl. 229—27 **9 Claims**



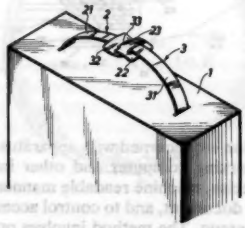
An end loading, twin carton separable into two cartons, embodying folded handles usable in the twin and also the separated mode. A blank for the carton is also disclosed.

3,677,459

HANDLE GRIPS FOR CARTON BOXES

Rinnosuke Susuki, Tokyo; Hiroshi Hoshi, Narashino; Shinichi Araki, Funabashi, and Masao Ishii, Yachiyoshi, all of Japan, assignors to Raion Yushi Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1970, Ser. No. 79,576
Claims priority, application Japan, Oct. 17, 1969, 44/98883
Int. Cl. B65d 5/46
U.S. Cl. 229—52 A **1 Claim**



This invention relates generally to a handle grip that can be firmly attached to a carton box, more particularly a convenient handle grip which is suitable for carrying a carton box relatively heavy as well as large in size. This handle grip comprises a pair of handle grip pieces having two main parts, two broader heads and two slits. The idea is that each main part is inserted through the slit of the other, respective main part, the ends of the two main parts distally of the respective heads being firmly attached to the flap of the carton box.

3,677,460

ENVELOPE HAVING CHEMICALLY TREATED EDGES

Nelson Whitman, Lincoln, Mass., assignor to Econo-Mail, Inc., New York, N.Y.

Filed April 13, 1970, Ser. No. 28,051
Int. Cl. B43m 7/00
U.S. Cl. 229—85 **4 Claims**

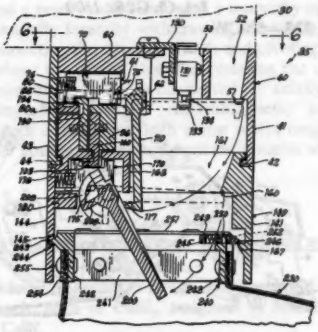
The present process is for opening paper constructions of structures, such as the marginal edges of envelopes, by treating a portion with a sensitizing agent which comprises an alkyl sodium sulfate, thereafter applying a developing agent comprising a strong organic acid to the sensitized portion, heating the developed portion to degrade it and thereafter applying mild mechanical action to remove the degraded portion.

3,677,461

SECURITY DEVICE

Robert M. Nitschneider, Cary; Charles G. Neumann, Palatine, and Harvey R. Krueger, Carpentersville, all of Ill., assignors to Reynolds Products Inc., Schaumburg, Ill.

Filed July 23, 1970, Ser. No. 57,699
Int. Cl. G07f 9/06
U.S. Cl. 232—15 **7 Claims**



An input conduit is attached to the outlet of a coin-processing mechanism and an output conduit is attached to the inlet of a coin container. The conduits are respectively provided with gates which are opened when the conduits are united to provide a passageway for coins to pass from the coin-processing mechanism to the coin container, and which are closed when the conduits are separated. to prevent withdrawal of coins from the coin container and the coin-processing mechanism.

3,677,462

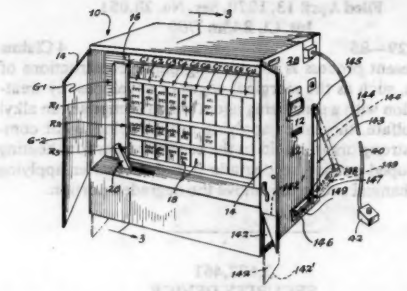
MECHANICAL VOTING MACHINE

Michael Terrance Moldovan, Jr., Lakewood, N.Y., assignor to AVM Corporation, Jamestown, N.Y.

Filed June 28, 1971, Ser. No. 157,446
Int. Cl. G07c 13/00
U.S. Cl. 235—54 R **14 Claims**

An improved mechanical voting machine embodying means facilitating the making of a single selection from a plurality of available ballot choices for each of two or more offices; such choices being presented as indicia carried on the faces of a plurality of voter operated push button selectors. The machine features an election official operated "entrance" control;

means for preventing the voter from causing the machine to record more than one vote for each office, while requiring that



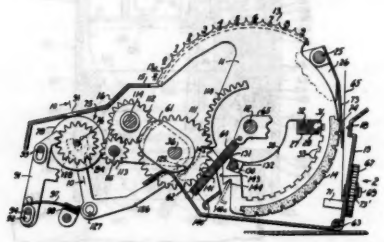
a vote be cast for both offices before he leaves the machine; and means for printing the election results on required numbers of print out sheets.

3,677,463

CHECKWRITER

Michael W. Grey, Azusa, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Aug. 4, 1971, Ser. No. 168,979
Int. Cl. G06k *1/00*
U.S. Cl. 235—58 CW **8 Claims**



A checkwriter having differentially settable printing sectors for printing amounts on checks and for subtracting such amounts from an accumulator which registers the balance in s user's bank account. The sectors are also used to add amounts in the accumulator representing deposits in the user's bank account. The sectors are manually advanced to different amount representing positions from home positions wherein they locate special symbols to be printed in lieu of amounts. After printing, the sectors are returned towards their home positions and during this movement they digitize the accumulator. Overthrow preventing means momentarily arrest the sectors and accumulator at zero registration of the sectors. The accumulator is then demeshed and the sectors are further returned to home positions. Intermeshing check locating members are provided to adjust a check relative to the printing line.

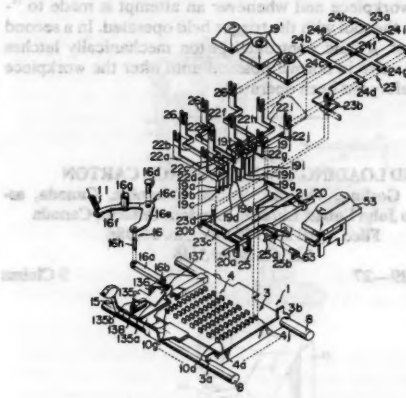
3,677,464

ADDING, SUBTRACTING AND TOTALING CALCULATOR

Harutaro Oba; Toshihiko Sawazu; Sugio Takeuchi, and Norio Yamaguchi, all of Shizuoka-ken, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1970, Ser. No. 8,680
Claims priority, application Japan, Feb. 6, 1969, 44/10339
Int. Cl. G06c *7/10*
U.S. Cl. 235—60 TK **3 Claims**

A carriage shifting mechanism for portable adding, subtracting and totaling calculators comprising shift pins arranged vertically on a carriage which is urged towards the higher order numerical positions, a carriage shifting member to depress, upon operating one of digit keys on a keyboard, the shift pin corresponding to the decimal place in which a



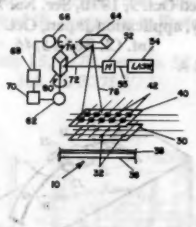
digit is set, and a stop member which is engaged with the shift pin when it is not depressed and which is disengaged therefrom when it is depressed, thereby enabling the carriage to be shifted by one decimal place towards a higher order decimal position upon depression of the shift pin.

3,677,465

METHOD AND APPARATUS FOR AUTHENTICATION OF INFORMATION RECORDS

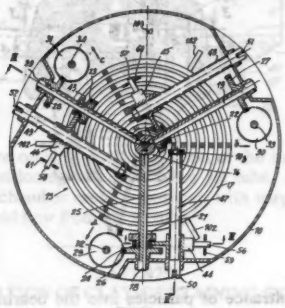
Everett A. Johnson, 15 S. Prospect Avenue, Park Ridge, Ill., and Daniel Silverman, 5969 S. Birmingham, Tulsa, Okla.

Continuation-in-part of Ser. No. 60,399, Aug. 3, 1970. This application Sept. 21, 1970, Ser. No. 74,066
Int. Cl. G06k *5/00*
U.S. Cl. 235—61.7 R **24 Claims**



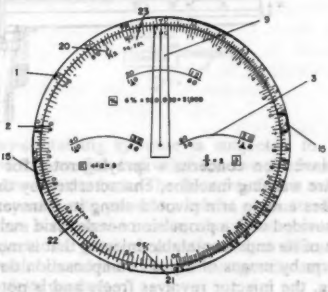
This invention is concerned with apparatus and methods for unerasably marking computer and other information documents in a precise, machine readable manner so as to identify the particular document, and to control access to the information stored thereon. The method involves preparing a master card of opaque material, through which microperforations have been burned in a predetermined pattern by a laser. This card is used as a pattern for a second laser, passing through the microperforations to burn an identical pattern through a facsimile card and/or through an opaque layer of the document, such as a digital photographic film or magnetic tape. The facsimile card is used, in conjunction with a reading means, to detect the pattern, identify the document and to control the operation of a computer to utilize the information on the document.

3,677,466
VARIATOR FOR A LIQUID DISPENSER
Henri Soupenne, Clamart, France, assignor to Compagnie Des Compteurs, Paris, France
Filed Dec. 12, 1969, Ser. No. 884,605
Claims priority, application France, Dec. 13, 1968, 178,097
Int. Cl. B67d 5/22
U.S. Cl. 235—61 L 4 Claims



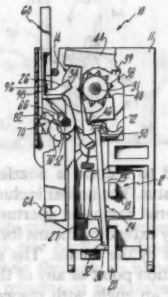
A gear box or mechanical speed variator particularly for liquid distributing measuring apparatus comprising a set of nine crown wheels arranged concentrically and whose number of teeth varies in the ratio of 1 to 9, said set of wheels cooperating with an assembly of sliding gears, each one of said gear selectively coming into engagement with any one of the gears of the multiple gear device.

3,677,467
DISC COMPUTER
Laurance Pierce, 2302 Calypso Road, Madison, Wis.
Filed June 23, 1970, Ser. No. 49,108
Int. Cl. G06g 1/08
U.S. Cl. 235—78 1 Claim



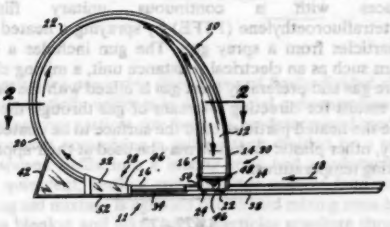
A disc computer having a lower disc with a peripheral scale at the edge of its upper face and an upper disc rotatably and concentrically secured at its center to the first disc. The upper disc being smaller in diameter than the lower disc and having a peripheral scale at the edge of its upper face for use in conjunction with the scale on the lower disc. The upper disc has a pair of diametrically opposed, transparent lugs extending from its peripheral edge substantially to, but not beyond the peripheral edge of the larger bottom disc to facilitate manipulation of the upper disc.

3,677,468
COUNTER MECHANISM
Lloyd J. LaPointe, West Hartford, and Howard J. Voegelin, Cheshire, both of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.
Filed July 22, 1970, Ser. No. 57,137
Int. Cl. G06c 15/42
U.S. Cl. 235—144 PN 11 Claims



A resettable counter having an electromagnetic stepping mechanism and a reset mechanism with a manually operable slide for sequentially laterally withdrawing a transfer pinion shaft for disconnecting the counter wheels and pivoting a reset finger comb about the pinion shaft for resetting the counter wheels. The manual reset slide is connected for axially pivoting a stepping pawl of the electromagnetic stepping mechanism out of engagement with a star wheel coupled to the lowest order counter wheel to permit the counter wheel to be reset.

3,677,469
LOOPED TRACK SYSTEM FOR TOY WHEELED VEHICLES
Russell C. Edmisson, Manhattan Beach, and Stanley R. Starr, Hermosa Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Sept. 2, 1970, Ser. No. 69,083
Int. Cl. A63h 19/30, 19/32
U.S. Cl. 238—10 E 11 Claims



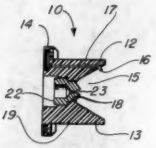
This is an accessory for a track system usable with toy wheeled vehicles which serves to change the direction of travel of vehicles traversing the track while at the same time causing the vehicles to travel through an essentially vertical loop. The track system utilizes well known linear sections of elongated flexible track and includes a loop-turn fixture having track securing members which serve to secure the track to the loop turn fixture.

3,677,470

NOZZLE HOLDER

Richard O. Probst, and Albert H. Moos, both of Indianapolis, Ind., assignors to Ransburg Electro-Coating Corp., Indianapolis, Ind.

Filed June 1, 1970, Ser. No. 41,898
Int. Cl. B05b 5/06
U.S. Cl. 239—15 11 Claims



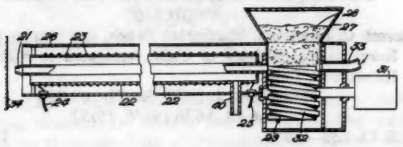
A holder adapted to receive a nozzle of an electrostatic spray coating apparatus. The holder includes a body of electrically insulative material having an aperture adapted to receive the nozzle, forwardly extending means formed in the body and an electrode carried by the means. The electrode terminates prior to the termination point of any of the forwardly extending means and is at an angle with respect to the axis of the aperture in the body adapted to receive the nozzle.

3,677,471

APPARATUS AND PROCESS THEREOF FOR COATING WITH POLYTETRAFLUOROETHYLENE AND OTHER MATERIALS

Stanley Thomas Deakin, Portsmouth, England, assignor to Sealectro Corporation, Mamaroneck, N.Y.

Division of Ser. No. 507,504, Nov. 12, 1965, abandoned. This application March 1, 1971, Ser. No. 119,850
Int. Cl. B44d 3/60
U.S. Cl. 239—85 5 Claims



An apparatus and method thereof are described for coating surfaces with a continuous unitary film of polytetrafluoroethylene (PTFE) by spraying a heated stream of particles from a spray gun. The gun includes a heating means such as an electrical resistance unit, a mixing chamber where gas and preferably inert gas is mixed with the particles, and means for directing a stream of gas through the gun to force the heated particles onto the surface to be coated. Obviously, other plastic materials may be used at their appropriate melting temperatures.

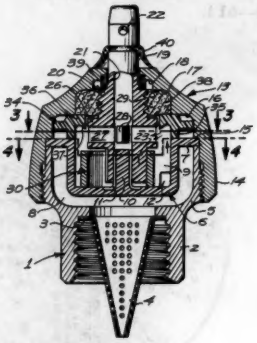
3,677,472

ROTARY SPRINKLER

Dennis L. Hart, Hacienda Hieghts, and Robert A. Howery, Covina, both of Calif., assignors to Raid Bird Sprinkler Mfg. Corp., Glendora, Calif.

Filed Oct. 15, 1970, Ser. No. 81,035
Int. Cl. B05b 3/04
U.S. Cl. 239—230 8 Claims

A rotary sprinkler including a tubular rotor having impact lobes and a surrounding impact ring, contained in a motor chamber into which water is admitted in a manner to produce a swirling action thereby to cause rotation of the impact ring. The lower end of the rotor fits an upstanding journal pin provided with grooves permitting the flushing of particles carried in the water. A thrust bearing is provided at the upper portion of the rotor and a labyrinth packing aided by a deflector ring



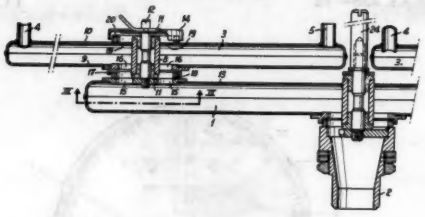
prevents entrance of particles into the bearing. Water exits from the motor chamber above the motor and below the deflector ring through passageways which tend to neutralize the swirling movement of the water.

3,677,473

SPRAYING ROTOR FOR A DISH WASHING MACHINE OR AN INDUSTRIAL GLASSWARE WASHING MACHINE

James Frank Belaieff, Collonge-Bellerive, Switzerland, assignor to Frame S.A., Fribourg, Switzerland

Filed Dec. 21, 1970, Ser. No. 100,273
Claims priority, application Switzerland, Jan. 29, 1970, 1247/70
Int. Cl. B05b 3/06
U.S. Cl. 239—251 9 Claims



The invention concerns a spraying rotor for an industrial glassware washing machine, characterized by the fact that it comprises a main arm pivoted along its transverse symmetry axis, provided with a propulsion nozzle. Said main arm carries at each of its ends a rotatable injector that is mounted on the main arm by means of a push compensation device. Thus in working, the injector revolves freely and is not subjected to axial forces.

3,677,474

ADJUSTABLE LIQUID DISCHARGE JET

Walter C. Lorenzen, Hacienda Heights, Calif., assignor to Anzen Products, Inc., Arcadia, Calif.

Filed May 6, 1970, Ser. No. 35,081
Int. Cl. B05b 15/08
U.S. Cl. 239—587 4 Claims

A housing adapted for enclosure in a pool wall has a chamber connecting between an inlet conduit and a discharge

jet tube mounted in a hollow ball retained by a face plate across the housing chamber. A spring biases a semispherical cup against the ball containing the discharge jet tube to secure the ball in movable sealing contact with a socket in the face

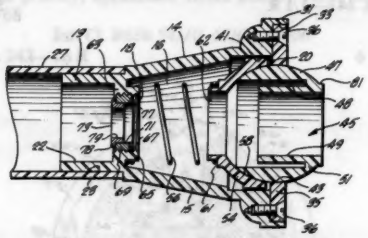


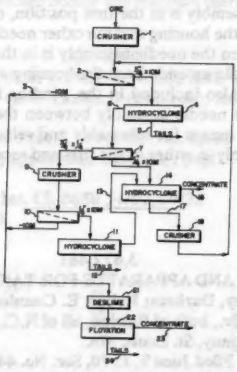
plate. Pressure on a protruding portion of the ball frees the ball for repositioning to redirect the jet tube. A threaded throat in the chamber receives bushings with varying orifices to change liquid flow from the jet tube.

3,677,475

BENEFICIATION OF CLAY-CONTAINING SYLVINITE ORE

William B. Dancy, Lakeland, Fla., assignor to International Minerals & Chemical Corporation

Filed Oct. 2, 1970, Ser. No. 77,630
Int. Cl. B03b 7/00
U.S. Cl. 241—20 **14 Claims**



Coarse clay-containing sylvinite is subjected to gravity separation and the overflow is divided into two portions by sizing at about one-quarter inch. The finer fraction is subjected to a gravity separation to provide a sylvite product while the coarser fraction is crushed to minus about one-quarter inch and then subjected to gravity separation to provide a sylvite concentrate which is subjected to another gravity separation to provide a sylvite product.

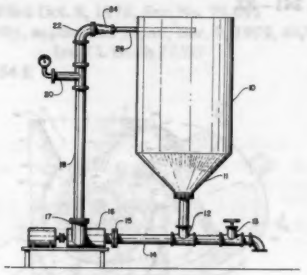
3,677,476

METHOD OF FINE-GRINDING

William L. Harned, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 1, 1970, Ser. No. 51,478
Int. Cl. B02c 17/00
U.S. Cl. 241—21 **4 Claims**

A method of grinding particulate matter comprising passing a fluid mixture comprising particulate matter and grinding bodies of a size between about 60 and about 200 mesh in a fluid vehicle through an impeller rotating at a speed to impart kinetic energy to said fluid mixture sufficient to achieve grinding. Preferably, particulate matter is ground to a size from about 0.5 to about 1.5 microns by circulating a fluid mixture



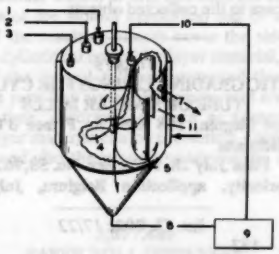
comprising particulate matter to be ground and annealed glass grinding bodies of a size between about 60 and about 200 mesh in a fluid vehicle through an impeller of a centrifugal pump, the impeller rotating at a peripheral speed of at least 3,000 ft/min.

3,677,477

APPARATUS FOR PREPARING DISPERSIONS OF FINELY-DIVIDED ALKALI METAL

Lloyd M. Watson, and William R. Birchall, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Division of Ser. No. 667,023, Aug. 18, 1967, Pat. No. 3,580,860. This application June 1, 1970, Ser. No. 54,075
Int. Cl. B02c 11/06
U.S. Cl. 241—31 **5 Claims**

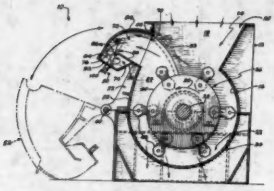


Apparatus for preparing dispersions of finely divided alkali metal substantially uniform in alkali metal concentration and having a narrow particle size below a predetermined median, said apparatus comprising a mixing tank divided by a vertically disposed baffle into a mixing zone and a substantially smaller quiescent, settling zone. Molten sodium feed and a dispersing aid mixture is agitated within said mixing zone in an inert gas blanket and alkali metal particles gravitate through the settling zone to the bottom of the mixing tank at which point the mixture containing said particles is drawn off in a continuous operation and passed to an homogenizer providing a high shear dispersion zone wherein the metallic particles are reduced in size and the mixture is returned to the mixing tank. Through repeated recirculation, such metallic particles as become reduced in size to the predetermined median size desired rise to the top of the quiescent, settling zone at which point the desired uniform dispersion containing only fine metallic particles within a closely controlled range is withdrawn.

3,677,478
METAL TRAP FOR HAMMER MILLS OR THE LIKE

Harry D. Schutte, Williamsville, N.Y., assignor to Schutte Pulverizer Co., Inc., Buffalo, N.Y.

Filed Nov. 19, 1970, Ser. No. 91,108
Int. Cl. B02c *13/06, 13/282*
U.S. Cl. 241—82 5 Claims

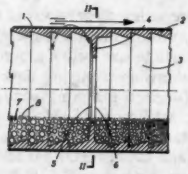


A trap for foreign objects, such as tramp metal, introduced into a hammer mill or the like having impact hammers supported within a mill cavity for rotational movement about a generally horizontal axis. The trap is characterized as being supported exteriorally of the mill cavity on a mill cavity access door and as being arranged in communication with the mill cavity through an access door defined opening disposed adjacent an inlet opening of the cavity. The trap is formed with a receiving chamber, a smoothly curved top wall plate extending from an upper edge of the trap opening for directing objects propelled therethrough by the impact hammers downwardly into the receiving chamber, a retaining plate extending from a lower edge of the trap opening in overlying relation to the receiving chamber for retaining objects collected therein, and a door bounding the receiving chamber for affording access to the collected objects.

3,677,479
AUTOMATIC GRADING LININGS FOR CYLINDRICAL TUBE OR SIMILAR MILLS

Pierre Arsene Slegten, 158 Ave. du Prince d'Orange, 1180 Brussels, Belgium

Filed July 28, 1970, Ser. No. 58,962
Claims priority, application Belgium, July 31, 1969, 736,856
Int. Cl. B02c *17/22*
U.S. Cl. 241—183 7 Claims

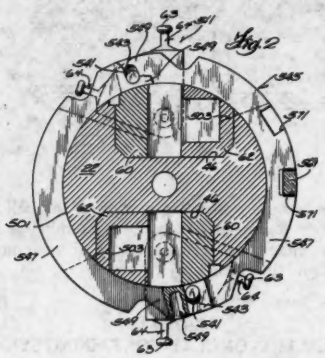


The invention relates to an automatic grading lining for a cylindrical tube or a similar mill, the inner surface in the mill bounding a series of trunco-conical volumes which are flared towards the mill entry and which lining further comprises one or more diaphragms having a central aperture of smaller diameter than the narrowest diameter portions of the trunco-conical volumes and being disposed in a plane substantially perpendicular to the mill axis.

3,677,480
DOUBLE NEEDLE WINDING HEAD

Robert L. Schanke, Muskego, Wis., assignor to Lincoln Tool & Manufacturing Co., Milwaukee, Wis.

Filed June 15, 1970, Ser. No. 46,274
Int. Cl. H02k *15/09*
U.S. Cl. 242—1.1 R 5 Claims

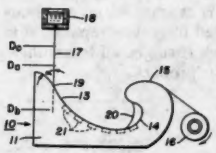


Disclosed herein is a winding head having a needle assembly which is mounted on a housing for movement between first and second positions and which includes first and second needles located in spaced relation to each other such, that when the needle assembly is in the first position, one of the needles extends from the housing and the other needle is retracted and such that, when the needle assembly is in the second position, the other needle extends from the housing and the one needle is retracted. Also included in the winding head is means for displacing the needle assembly between the first and second positions and means for releasably and selectively locking the needle assembly in either of the first and second positions.

3,677,481
METHOD AND APPARATUS FOR TAKING UP FIBER

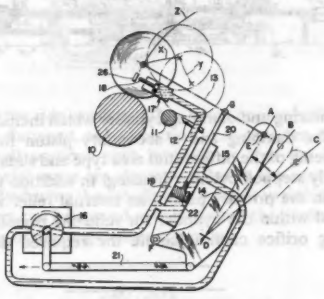
David J. Haley, Durham; Robert E. Cunningham, and Wilbur J. Privott, Jr., both of Raleigh, all of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed June 9, 1970, Ser. No. 44,821
Int. Cl. B65h *54/00*
U.S. Cl. 242—18 R 17 Claims



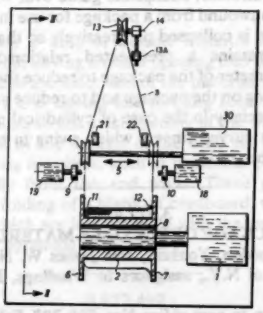
An in-line take-up apparatus and process isolate the tensional forces needed in a fiber for good packaging about a wind-up member from the portion of a fiber having very low tensile strength which occurs immediately after extrusion.

3,677,482
WINDING MACHINE
John McKenzie, Whitefield, England, assignor to Leesons Limited
Filed Nov. 18, 1969, Ser. No. 877,863
Claims priority, application Great Britain, Nov. 19, 1968, 54,737/68
Int. Cl. B65h *54/10, 63/00, 67/00*
U.S. Cl. 242—18 R 6 Claims



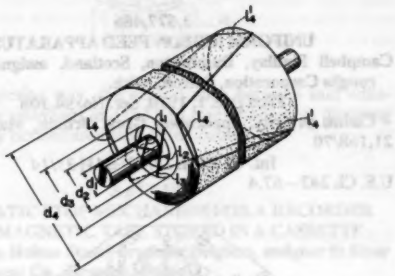
Braking mechanism for use with a winding machine is disclosed. The winding machine includes a package holder which is movable from a winding position to a displaced position upon interruption of the yarn being wound on the holder. As the package holder shifts to its displaced position a hydraulic push rod is extended to actuate a package holder brake located interiorly of the package holder thereby arresting rotation of the package holder and the yarn thereon.

3,677,483
APPARATUS FOR WINDING WIRE AND THE LIKE
Werner Henrich, 6349 Horbach (Dillkreis), am Wachtgipfel, Germany
Filed Feb. 4, 1970, Ser. No. 8,523
Claims priority, application Germany, Sept. 12, 1969, P 19 46 220.5
Int. Cl. B65h *54/02, 54/28*
U.S. Cl. 242—25 R 6 Claims



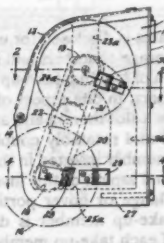
A wire winding apparatus reciprocates a wire along the length of a drum so that wire is wound around the drum in uniform layers. The limits of reciprocation of the wire are controlled by limit switches whose positions are adjusted in response to the tension of the wire just before it is reciprocated. Before being reciprocated, the wire passes over a pivotally mounted counterbalanced pulley with the pivotal movement of the pulley, in response to the tension of the wire, controlling a mechanism for adjusting the limit switches to obtain uniform layers of wire around the drum.

3,677,484
METHOD FOR WINDING UP A THIN LAYER MATERIAL HAVING A BROAD WIDTH
Masahide Yazawa, and Haruhisa Tani, both of Tokyo, Japan, assignors to Polymer Processing Research Institute Ltd., Tokyo, Japan
Filed Oct. 8, 1970, Ser. No. 79,091
Claims priority, application Japan, Dec. 9, 1969, 44/99208
Int. Cl. B65h *75/00*
U.S. Cl. 242—54 R 1 Claim



A thin layer material having a large width can be wound up around a winding core by continuously supplying and inserting an elongated continuous yarn-like material, which traverses the thin layer material, in between one wound layer and another to leave a clearance along the inserted yarn-like material. Irregularities in thickness of the thin layer material are absorbed into the clearance, whereby a long length of wide thin layer material can be wound up into a cylindrical form of larger diameter. Further, by making a width to which the yarn-like material is extended, when supplied by reciprocatingly traversing the layer material, larger than the width of the wound thin layer material, and thus supplying the yarn-like material beyond both the edge parts of the thin layer material, the greater portion of thus supplied yarn-like material can be formed into almost wound at first and then arc chords at both the side faces of the wound cylindrical roll of the thin layer material, and the resulting chords cover the side surfaces of the woundup cylindrical roll of the layer material, whereby the side faces of the wound roll are protected through a large number of the yarn-like materials forming said arc chords, and at the same time, deformation, such as telescoping of the wound thin layer material can be prevented, even when loosely wound up and also the successive unwinding can be easily assured.

3,677,485
PAPER ROLL DISPENSER
Coleman David Berg, Philadelphia, Pa., assignor to Fleck Industries, Inc., Willow Grove, Pa.
Filed Aug. 19, 1970, Ser. No. 64,960
Int. Cl. B65h *19/04*
U.S. Cl. 242—55.3 13 Claims



A paper roll dispenser adapted to sequentially dispense paper from a plurality of paper rolls and including a pair of roll

mounting spindles having interconnecting linkage for positioning the spindles in spaced parallel relation, and mounting means for the spindles including guiding means providing for sequential movement of the paper rolls to a dispensing station.

ERRATUM

For Class 242—56 see:
Patent No. 3,677,505

3,677,486

UNIFORM RIBBON FEED APPARATUS

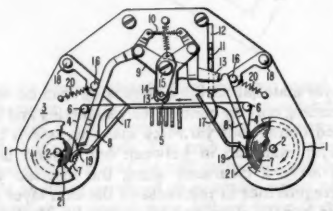
Campbell Findlay, Dumbarton, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 1, 1970, Ser. No. 94,108

Claims priority, application Great Britain, May 1, 1970, 21,168/70

Int. Cl. B65h *17/02*; **B41j** *33/14*

U.S. Cl. 242—67.4 **6 Claims**



A ribbon feeding apparatus having a ratcheted ribbon spool engageable by a reciprocating pawl to incrementally rotate the ribbon spool. A camming lug operatively coupling the pawl and responsive to the diameter of the ribbon on the spool inversely varies the increment of angular engagement of the pawl with the ratchet wheel as the ribbon diameter increases, thus effecting uniform ribbon feed.

3,677,487

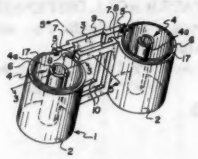
APPARATUS FOR STORING STRIP MATERIAL

Frederick G. Knowles, Rochester, and Clarence R. Taylor, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 3, 1970, Ser. No. 8,267

Int. Cl. G03b *1/04, 23/04*

U.S. Cl. 242—71.2 **4 Claims**



Strip storage apparatus is disclosed for use in a film viewer, which includes two storage chambers and is open on one end to allow rapid insertion of two film take-up members on shafts disposed in the chambers. In one aspect of the invention, the take-up members have a slot therein and are rotatably held in the storage apparatus and rotatably coupled to the shaft by means of a fastening member inserted in the slot of each take-up member. In a second aspect of this invention, the take-up member includes a flange or cover portion for closing the chamber when the take-up member is disposed therein. A keyway on the end of each take-up member may be engaged by suitable drive means in the viewer to selectively rotate one of the take-up members.

3,677,488

TRIM AND DAMPING CYLINDER

Wilfred E. Boehringer, Fullerton, Calif., assignor to McDonnell Douglas Corporation

Filed Feb. 16, 1971, Ser. No. 115,229

Int. Cl. B64c *25/34*

U.S. Cl. 244—103 R **15 Claims**

A centering and damping cylinder which includes a primary piston for damping and a secondary piston for trim, each piston being of the differential area type and slidable within an internally stepped cylinder housing. In addition to a damping orifice in the primary piston, an internal relief valve may be provided within the cylinder for relieving pressure when the damping orifice cannot handle the required damping flow rate.

3,677,489

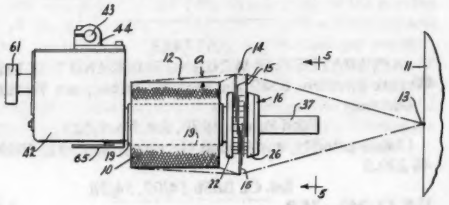
GUIDE FOR UNWINDING THREAD FROM A PACKAGE

George R. Dilling, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Sept. 14, 1970, Ser. No. 71,746

Int. Cl. B65h *49/00*

U.S. Cl. 242—129.72 **9 Claims**



A generally circular, collapsible guide over which thread is drawn as it is unwound from a package for use in a loom or the like. The guide is collapsed progressively so that its diameter substantially retains a preselected relationship with the decreasing diameter of the package to reduce the possibility of thread sloughing on the package and to reduce various tension problems, especially in the case of cylindrical packages. The guide includes curved fingers which swing in to achieve the collapsing of the guide.

3,677,490

PACKAGE OF FLEXIBLE MATERIAL

William F. Gordon, Yonkers, and James W. Newman, Scarsdale, both of N.Y., assignors to Windings, Inc., Yonkers, N.Y.

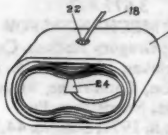
Continuation-in-part of Ser. Nos. 709,305, Feb. 29, 1968, abandoned, and Ser. No. 18,780, March 2, 1970. This application July 16, 1970, Ser. No. 55,407

Int. Cl. B65h *55/02*

U.S. Cl. 242—163 **14 Claims**

A package of flexible material is produced by a winding in the nature of a universal wind on a spindle of oblong shape, or by winding a package on a cylindrical spindle and thereafter compressing the package in a direction transverse to the spindle axis into an oval shape. A radial hole is built into the package, preferably substantially at one of the sides of the oblong, and the flexible material is fed out from the interior of

the package through this hole by means of a payout tube inserted in the hole and extending into the central interior of the package where it flares outwardly. The completed package, if wound on a mandrel having flat sides, while the guide and the spindle maintain constant speeds, will be thicker in the elongated sides than in the substantially semi-edge portions because the cross-overs in the end portions are spaced further



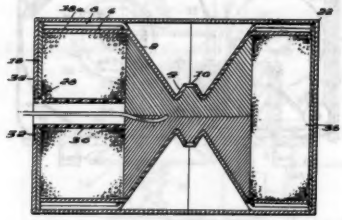
apart than in the side portions. Thus when one or both of the side walls are flattened, as by insertion in a container, the flattened side wall portions push inwardly so that the interior walls of the axial space are closer together at the center than at the sides. By driving the spindle at a suitable variable speed, the cross-overs can be spaced evenly around the package and the thickening of the longer sides is avoided.

3,677,491

BOX WITH INWARDLY TAPERING GUIDE CONES FOR UNIVERSAL WIND PACKAGE WITH RADIAL PAY-OUT

Jeffrey C. Gerwig, Yonkers, N.Y., assignor to Windings, Inc., Yonkers, N.Y.

Filed Oct. 9, 1970, Ser. No. 79,455
Int. Cl. B65h *55/00*
U.S. Cl. 242—163 **7 Claims**



A package for a wind of flexible material wound with a universal wind but having a radial opening into the axial opening through which the inner end of the material is brought out is enclosed in a box having end-forming flaps hinged about axes perpendicular to the axial opening of the wind. The coils being pulled off of the interior of the wind are controlled by inwardly tapering members, such as truncated pyramids, projecting inwardly from the end walls. These pyramids are formed by the folding of a blank of cardboard, which has extending flaps which are interengaged with the end flaps of the box to hold the pyramids in position.

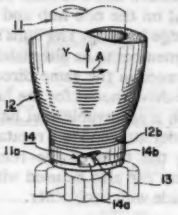
3,677,492

BOBBING WINDING

Haruo Ueda; Masanao Sugi, and Hiroshi Chayamichi, all of Nobeoka, Japan, assignors to Asashi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed July 16, 1970, Ser. No. 55,302
Claims priority, application Japan, Jan. 23, 1970, 45/5722
Int. Cl. B65h *55/00*
U.S. Cl. 242—164 **1 Claim**

This invention relates to a bobbin structure, bearing an adhesively stuck tab having an adhesive-bearing main part and at least a non-adhesive-bearing flap. The improvement resides in that said flap is formed laterally of said main part and a rounded leading nose is formed on said flap in an inclined and



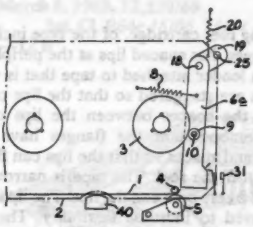
axially projecting way, the critical zone between said adhesive-bearing main part and the flap free of adhesive directing substantially circumferentially of the bobbin.

3,677,493

AUTOMATIC STOP MECHANISM FOR A RECORDER USING MAGNETIC TAPE STORED IN A CASSETTE

Marcel Jules Helene Staar, Brussels, Belgium, assignor to Staar Development Co., Brussels, Belgium

Filed Feb. 16, 1971, Ser. No. 115,199
Claims priority, application Belgium, Feb. 13, 1970, 745964
Int. Cl. B65h *59/38*; G03b *1/02*; G11b *15/13*
U.S. Cl. 242—191 **9 Claims**



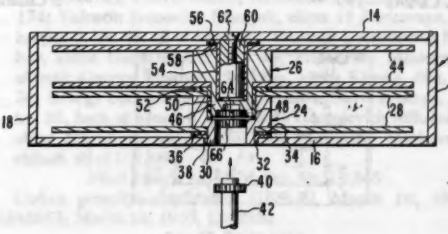
A take-up reel drive control for tape recorders incorporating an automatic shut-off feature which utilizes the same motive force that drives the take up reel for actuating the automatic shut-off mechanism. Additionally, the same motive force can be used to bring the recording-playback elements, such as the payback head, into their inoperative position.

3,677,494

TAPE CARTRIDGE CONSTRUCTION

Arthur I. Protas, Cupertino, Calif., assignor to Cartridge Television, Inc., New York, N.Y.

Filed Dec. 8, 1969, Ser. No. 883,084
Int. Cl. G03b *1/04*; G11b *15/32*
U.S. Cl. 242—194 **21 Claims**



A reel-over-reel tape cartridge having a pair of axially aligned tape hubs and improved means for mounting the hubs

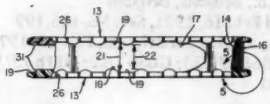
for rotation independently of each other within a cartridge housing. One hub has a tubular extension permitting it to be rotatably mounted on one wall member of the housing and the other hub has an extension and a tubular body to permit it to be rotatably mounted on the one hub and on a second wall member of the cartridge housing. The hubs are formed to permit a rotatable drive member to be alternately coupled thereto to cause rotation thereof in the same direction to avoid the need for a reversible drive means for the hubs. The cartridge can be provided with a removable reel having a tape which mates with a tape leader attached to a rotatable hub in the cartridge for receiving the tape of the removable reel. The removable reel feature can also be used with a cartridge having the reels side by side with each other.

3,677,495

TAPE RETAINING REEL CARTRIDGE

Walter H. Villers, Chicago, and Ernest B. Johnson, Niles, both of Ill., assignors to Ampex Corporation, Redwood City, Calif.

Filed March 5, 1971, Ser. No. 121,503
Int. Cl. G11b *23/10*
U.S. Cl. 242—197 **10 Claims**



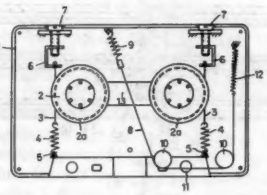
A tape retaining reel cartridge, of the type including a hub and two side flanges, has spaced lips at the periphery of each flange to retain a leader attached to tape that is wound upon the hub. The lips are staggered so that the lips of one flange axially confront the spaces between the lips of the other flange. In one embodiment the flanges have radial cuts between the lips and spaces so that the lips can flex when the leader is tripped off the reel. The tape is narrower than the leader and passes freely between the lips. The lip sectors of the flanges are relieved to increase flexibility. The flanges are formed with circumferential ledges to hold the leader axially outwardly, and portions of the flanges between the ledges and the lips are formed to sloping shape to urge the leader radially inwardly. In another embodiment, the reel is mounted inside a housing, with a stripper for the leader that permits stripping only when the housing is mounted on a suitable transport mechanism.

3,677,496

TAPE TENSION CHECKING DEVICE FOR CASSETTE RECORDERS

Siegfried Apitz, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed April 15, 1970, Ser. No. 28,886
Claims priority, application Germany, April 16, 1969, P 19 19 371.6
Int. Cl. G03b *1/04*; G11b *15/32, 23/04*
U.S. Cl. 242—199 **3 Claims**



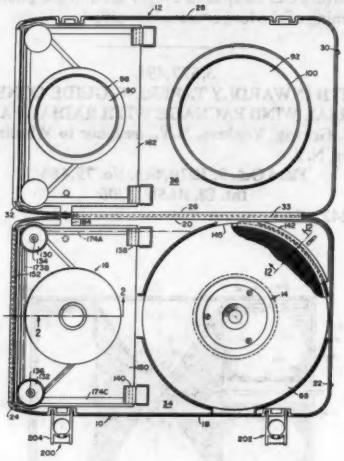
This invention relates to a tape tension checking device for cassette type tape recorders. The torques to be measured are simulated by limiting-force clutches which are accommodated in a tape cassette (cartridge). From either the rotation of the simulated tape spools, or the standstill thereof it can be immediately determined whether there exists the necessary tape tension or torque respectively.

3,677,497

TAPE CARTRIDGE MECHANISM FOR COMPUTER

Alan B. Lowry, Canton; Gregory Mathus, Cambridge, both of Mass., and Leon Staciokas, Lionville, Pa., assignors to Data Packaging Corporation, Cambridge, Mass. and Digital Information Devices, Inc., Norristown, Pa.

Filed June 8, 1970, Ser. No. 44,112
Int. Cl. G03b *1/04*; G11b *15/32, 23/04*
U.S. Cl. 242—199 **20 Claims**



A cartridge having a stabilizer system for standard IBM-type computer tape reels that may be placed in the cartridge for recording and subsequently be removed from the cartridge for use on a computer. A separate take-up reel is provided in the cartridge onto which the tape is wound. Each reel is movable axially and laterally in the cartridge and can be engaged by external drive spindles.

3,677,498

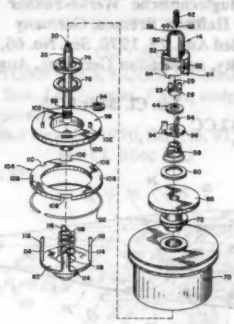
SPINDLE ASSEMBLY FOR WEB HANDLING APPARATUS

Robert B. Johnson, and Thomas G. Kirn, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed March 1, 1971, Ser. No. 119,693
Int. Cl. B11b *15/32*; G03b *1/04*
U.S. Cl. 242—207 **10 Claims**

A spindle assembly for use in a web handling apparatus is selectively adjustable to establish between a drive member for a roll of web material and a power input member either a weight responsive, friction drive connection or a direct coupled connection. The axis of rotation of the spindle assembly

is movable relative to the web handling apparatus to selectively position the spindle assembly at different ones of predetermined positions for supporting rolls of various capacities of web material.



3,677,499

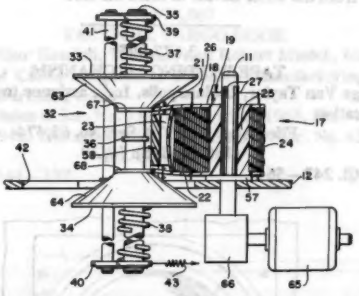
APPARATUS FOR FEEDING STRIP MATERIAL OF DIFFERENT WIDTHS

Elmer O. Wangerin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 29, 1971, Ser. No. 110,915

Int. Cl. G11b *15/66, 15/32*

U.S. Cl. 242—210 **14 Claims**



Strip feeding apparatus of the kind in which a pair of opposed rollers successively flex toward each other opposed regions of the flange members of a rotating reel as those regions are respectively rotated past the rollers, includes a pair of flange-flexing rollers which are movable relative to each other to vary the distance therebetween and thereby provide flexing engagement selectively with reels of different flange member spacing.

3,677,500

SCANNING INTERFEROMETER-BEAM RIDER GUIDANCE SYSTEM

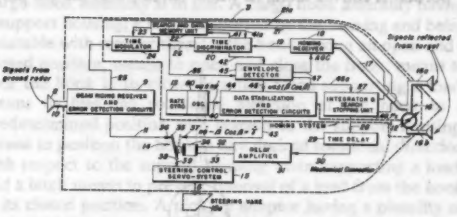
Carl W. Brown; Allen B. Reppert, and Billy D. Dobbins, all of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Nov. 10, 1952, Ser. No. 319,624

Int. Cl. F41g *7/18*

U.S. Cl. 244—3.13 **20 Claims**

1. A missile guidance system including, in combination with a missile and a source of electromagnetic energy, said source being remote from the missile and projecting a guiding beam, means for maintaining the missile in and under the control of said beam, said means including an antenna mounted on the missile and a receiver connected to the antenna, a steering vane on the missile, a servo for controlling the vane, said servo being responsive to signals entering the receiver through the antenna from the beam, switching means between the receiver



and the servo, means in the missile for searching for a target, and means controlled by said last mentioned means and operable in response to a signal reflected from an acquired target for actuating said switching means whereby operation of the servo will be transferred from the first-mentioned means to the reflected-signal operated means for controlling the vane for guiding the missile into the target.

3,677,501

JET PROPULSION POWER PLANT

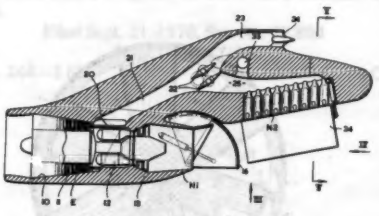
Ralph Murch Denning, Bristol, England, assignor to Rolls-Royce Limited

Filed March 9, 1970, Ser. No. 17,852

Claims priority, application Great Britain, March 8, 1969, 12,338/69; March 8, 1969, 12,339/69

Int. Cl. B64c *15/06, 15/14*

U.S. Cl. 244—12 B **6 Claims**



This disclosure pertains to a jet propulsion power plant comprising a gas turbine engine having a first exhaust nozzle whose noise level is kept low by a relatively low pressure/area ratio at the nozzle, and having a plurality of second exhaust nozzles whose noise level is kept low by a pressure/area ratio of the individual nozzles which is sufficiently high to cause the peak of the noise spectrum to be of ultrasonic frequency.

3,677,502

SUPERSONIC AIRCRAFT

Andrei Nikolaevich Tupolev, Leninsky prospekt, 14; Alexei Andreevich Tupolev, ulitsa Stanislavskogo, 15, kv. 25; Georgy Alexeevich Cheremukhin, Krasnokazarmennaya, 9, kv. 174; Valentin Ivanovich Bliznjuk, ulitsa 11 Parkovaya, 37, korpus 3, kv. 46, all of Moscow; Alexandr Leonidovich Pukhov, ulitsa Gagarina, 35, kv. 47, Zhukovsky Moskovskoi oblasti; Georgy Petrovich Svischev, ulitsa Kirova, 40a, kv. 26; Georgy Sergeevich Bjushgens, ulitsa Suvorovskaya, 1/2, kv. 26, both of Moscow, and Vitaly Georgievich Mikeladze, ulitsa Mayakovskogo, 17, kv. 20, Zhukovsky Moskovskoi oblasti, all of U.S.S.R.

Filed March 10, 1970, Ser. No. 18,049

Claims priority, application U.S.S.R., March 10, 1969, 1348853; March 10, 1969, 1348854

Int. Cl. B64c *1/00*

U.S. Cl. 244—13 **2 Claims**

A supersonic aircraft particularly for use under the conditions of an endurance flight at supersonic speeds in which the

fuselage is provided with a delta wing having engines mounted under the middle portion thereof and with a tail portion disposed behind the wing. The cross section of the aircraft tail portion is convex along its whole length, with the tail portion

proper being somewhat raised with respect to the wing from its bottom to the end to preclude the contact thereof with the gas stream exhausted from the engines and the nose portion has substantially improved properties of reflecting heat rays.

3,677,503

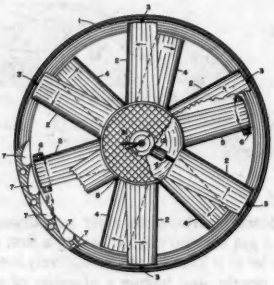
REACTION–IMPULSE–COUNTERROTATING–AIRFOIL

Carlos A. Freeman, Jr., P.O. Box 135, Snow Hill, Md.

Filed July 31, 1968, Ser. No. 749,112

Int. Cl. B64c *29/00*

U.S. Cl. 244—23 **15 Claims**



This invention relates to a self-contained flight machine that may function in and of itself as an aircraft or that may form a part or all of the lift and/or propulsion element or elements of an aircraft. The invention consists of two separate airfoil systems, each borne upon and radially extending in the horizontal plane from a concentrically located shaft, about which they are driven in rotation and counterrotation by the reaction of two or more propulsion engines mounted upon the radial extremity of the airfoils of one of the systems; the exhaust impulse of the aforesaid engines is employed to drive the other airfoil system in counterrotation, thusly constituting an impulse reaction drive system. The drive is encompassed by an aerodynamic duct borne upon the radial extremity of the airfoils of the counterrotation system. This ducting, or collar, provides for the mounting of the deflection vanes that receive the impulse from the reaction engines, as well as ducting the airflow resultant from the combined thrust of the airfoil systems and the exhausted gases of combustion through the craft in a manner similar to that of fan or propeller driven aerodynamic ducts. A control, passenger and/or payload platform is affixed to the aforesaid concentric shaft. The aircraft takes off vertically and means are provided to cant the unit so as to travel and maneuver in the horizontal plane.

3,677,504

CONTROL FLAP ARRANGEMENT

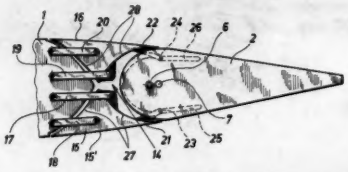
Hans-Jurgen Schwarzler, Munich, Germany, assignor to Vereinigte Flugtechnische Werke-Fokker Gesellschaft mit beschrankter Haftung, Bremen, Germany

Filed Aug. 25, 1970, Ser. No. 66,784

Claims priority, application Germany, Aug. 28, 1969, P 19 43 680.7

Int. Cl. B64c *9/18*

U.S. Cl. 244—42 CC **4 Claims**



A control flap arrangement for an airfoil of an aircraft has a control flap with a nose surface defined by a center of curvature. The control flap is mounted to the airfoil for pivoting movement with respect thereto, and is actuated by a fluid piston-cylinder device which is connected to the airfoil and to the control flap at a point offset from the pivot point thereof. Cover members are mounted in the slot formed between the control flap and the airfoil in such a manner that when the control flap is pivoted with respect to the airfoil the respective one of the cover members arranged in the slot on the side to which the control flap is pivoting will move away from the airfoil to divert air through the slot and the control flap will move away from the other device to form the slot.

3,677,505

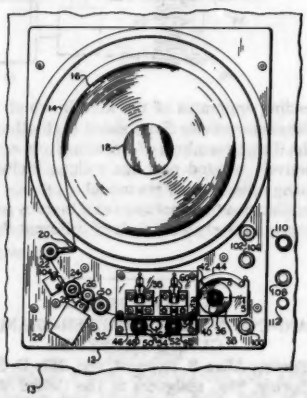
TAPE WINDING MECHANISM

George Van Taylor, Indianapolis, Ind., assignor to RCA Corporation

Filed Aug. 10, 1970, Ser. No. 62,474

Int. Cl. B65h *19/20*

U.S. Cl. 242—56 R **25 Claims**



A tape winding machine includes a supply reel of tape having a portion which is to be transferred to two hubs. The tape is unwound from the supply reel and is wound onto one of the hubs which is mounted on a rotatably driven spindle. The spindle is driven by a motor through a clutch. The other hub is mounted on a stationary spindle adjacent a staking mechanism. The staking mechanism stakes the tape to the second hub while the tape is in motion. The staking causes the clutch to slip and thereby abruptly terminate the rotation of the first hub.

ERRATUM

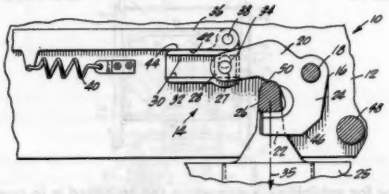
For Class 244—103 see:
Patent No. 3,677,488

3,677,506

STORE RACK HOOK ASSEMBLY

Emmett T. La Roe, Los Angeles, Calif., assignor to McDonnel Douglas Corporation

Filed Nov. 23, 1970, Ser. No. 91,930
Int. Cl. B64c 1/22
U.S. Cl. 244—137 **13 Claims**



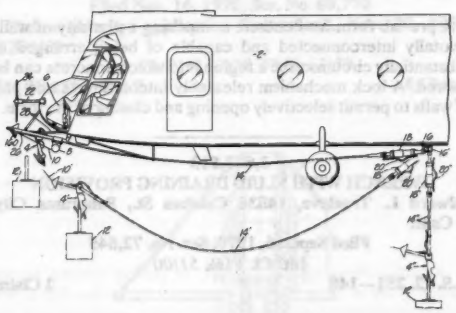
A hook assembly for supporting a bomb or other type store to a carrying vehicle such as an aircraft. The store hook of the assembly is supported at pivots on opposite sides of its store lug engaging portion to distribute the load applied thereto. The assembly includes a cam which when rotated allows movement of one of the hook supports so that the hook can rotate to disengage itself from the store lug.

3,677,507

TACTICAL CARGO HOOK

Giles Arthur Kendall, Tarzana, and Robert Minick, Glendale, both of Calif., assignors to Menasco Manufacturing Company, Burbank, Calif.

Division of Ser. No. 718,531, April 3, 1968, Pat. No. 3,608,948. This application July 23, 1970, Ser. No. 63,993
Int. Cl. B64c 1/22
U.S. Cl. 244—137 **6 Claims**



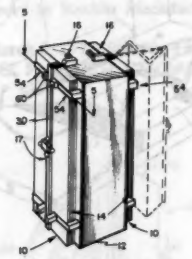
A cargo hook system having a drogue which may be supported on the nose of a helicopter; a cargo hook assembly and a probe supported from the cargo hook assembly, said cargo hook assembly having a hook movable from an open to a closed position, and means to maintain the hook in an unloaded condition in a direction facing toward the probe, means to position the hook in any desired direction when supporting a load, means to open and close the hook, means to lock the hook in its closed position when loaded, and latch means to prevent removal of a load from said hook in its closed position; support means for the cargo hook assembly which may be connected to a helicopter at or near its center of mass; and means to guide the probe into the drogue, to maintain the probe in the drogue when the cargo hook assembly is not in use, and to release the probe from the drogue when the cargo hook assembly is in use. A cargo hook assembly having a support housing; a hook supported by the housing and being rotatable with respect thereto; the hook having an open and a closed position; means to open and close the hook; means to lock the hook in its closed position when supporting a load; means to bias the rotational direction of the hook to a predetermined position with respect to the support housing; means to position the hook in any desired rotational direction with respect to the support housing when supporting a load; and a latch means to prevent removal of a load from the hook in its closed position. A pick-up adaptor having a plurality of frame members connected pivotally in a sequential end-to-end relation; the end-most frame members connected to load support means; means biasing the frame members to maintain the unloaded adaptor in a collapsed condition in which one of the frame members having a curved and a straight portion has its straight portion in a substantially horizontal position to provide a target area for the engagement of a hook; the frame members forming an inverted V-frame structure when the adaptor is loaded, the load being supported by a hook which engages the horizontal straight portion of the said frame member having a curved portion, the hook sliding upwardly to the curved portion of the member as the adaptor forms an erect inverted V-frame structure under load conditions.

3,677,508

FOLDING DEPLOYABLE PANEL STRUCTURE HAVING ROLL-UP RETAINING SPRING FOR STOWAGE

Paul A. Dillard, Littleton, Colo., and Donald R. Baker, Lawndale, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sept. 21, 1970, Ser. No. 73,884
Int. Cl. B64g 1/30
U.S. Cl. 244—1 SS **9 Claims**



A deployable folding panel structure for a spacecraft solar array and other uses having a folding panel which is extendable from a folded stowed configuration to a flat unfolded deployed configuration, and self-coiling panel retaining springs which are held flat against the folded panel sections in stowed configuration to retain the panel sections firmly in position and are released at the start of deployment to roll up or coil by elastic strain energy to retracted positions wherein the springs clear the panel for extension to deployed configuration.

3,677,509

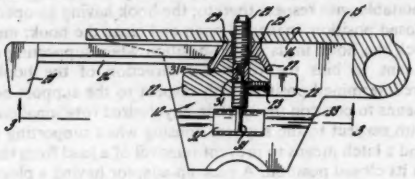
TIEDOWN DEVICE

Chadwell O'Connor, 3490 E. Foothill Boulevard, Pasadena, Calif.

Filed Aug. 31, 1970, Ser. No. 68,342
Int. Cl. F16m 11/08
U.S. Cl. 248—187 **4 Claims**

A lever operated locking device suitable for a camera-pan-head assembly in which a manually rotatable camera tiedown

screw is supplemented by a bushing and locking lever interposed between the screwhead and the tripod mounting plate. Conical, mating clutch surfaces are provided between the screwhead and the bushing so that during loose engagement of



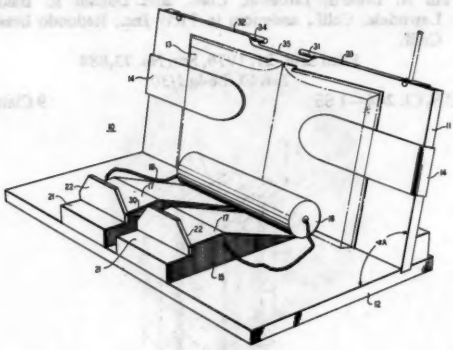
a camera the screwhead may be easily turned independently of the locking lever, with final tight locking or unlocking movement being accomplished by moving the locking lever through a small arc.

3,677,510

BOOK SUPPORT FOR THE PHYSICALLY INFIRM

Edward Albert Kenwell, 21 Meadowbrook Drive, Somerville, N.J.

Filed Jan. 11, 1971, Ser. No. 105,243
Int. Cl. A47b *23/04*
U.S. Cl. 248—441 **8 Claims**



Book supports are herein adapted for use by the physically infirm via the use of a lightweight roller which engages the pages of a book and keeps them from turning. The roller is secured to a ramp arrangement which is part of the margin support upon which a book sits. Only when the roller is at the top of the ramp, are the pages free to turn.

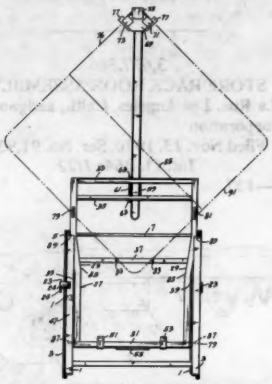
3,677,511

PORTABLE FOLDING WARNING SIGN STANDARD

Clarence C. Dicke, Downers Grove, Ill., assignor to Dicke Tool Company, Downers Grove, Ill.

Filed Dec. 15, 1970, Ser. No. 98,307
Int. Cl. G09f *19/00*
U.S. Cl. 248—448 **13 Claims**

A portable folding standard for supporting a sign has an A-frame pivoted at the top so that the legs can be collapsed into a folded position, bracing links pivoted to the A-frame which can be locked when the frame is in open position and folded alongside the frame when the frame is in closed position, a swinging frame pivoted to the top of the A-frame, balancing springs connected between the swinging frame and the A-frame, and a vertical mast, adaptable for elevation, carried on the swinging frame. The frame and mast are provided with



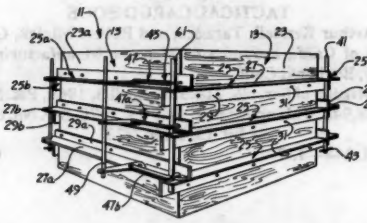
means for exhibiting a sign when the standard is in open position and for storing the sign when the standard is in folded or closed position.

3,677,512

PRE-FAB FORM FOR CONCRETE

Robert E. Thomas, 9581 Vons Drive, Garden Grove, Calif.

Filed July 27, 1970, Ser. No. 58,611
Int. Cl. E04q *13/02*
U.S. Cl. 249—48 **15 Claims**



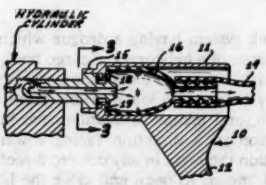
A pre-fab form for concrete comprising a plurality of walls pivotally interconnected and capable of being arranged to substantially circumscribe a region into which concrete can be poured. A lock mechanism releasably interconnects one pair of walls to permit selectively opening and closing of the form.

3,677,513

WRENCH WITH FLUID DRAINING PROVISION

Edward L. Truelove, 14836 Calahan St., Panorama City, Calif.

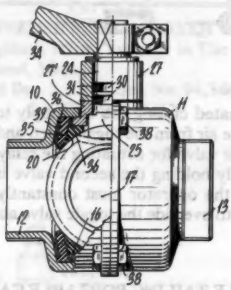
Filed Sept. 16, 1970, Ser. No. 72,645
Int. Cl. F16k *51/00*
U.S. Cl. 251—148 **2 Claims**



A wrench for removing drain plugs, opening or bleeding hydraulic valves or the like when fluid is released. The wrench

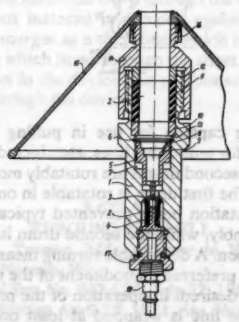
is provided with an elongated tubular conduit continuous with the head of the wrench so that the released fluid enters the wrench and flows through the tubular conduit to a remote location for storage or disposal purposes.

3,677,514
BALL VALVE
Vittorio Mencarelli, Viale Monza, 16, Milan, Italy
Filed Feb. 24, 1971, Ser. No. 118,347
Claims priority, application Italy, March 3, 1970, 21421 A/70; Feb. 11, 1971, 20418 A/71
Int. Cl. F16k *5/02*
U.S. Cl. 251—148 17 Claims



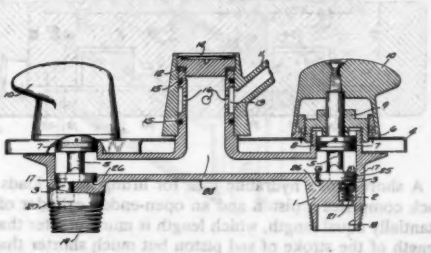
A ball valve of stamped plate, comprising a hollow valve body having fluid inlet and outlet, within said body a cylindrical band containing a hollow ball provided with two diametrically opposite apertures, said ball being rotatable according to an axis at right angles to the flow direction between open and closed positions, a ball control rod engaging said ball by its lower end and, in turn, being pivoted in a collar projecting from said cylindrical band, seals being interposed between said ball, cylindrical band and housing.

3,677,515
COUPLING FOR COMBUSTION TUBES
Edwin Eduard Fassler, Wibichstrasse 25, Zurich, Switzerland
Filed Nov. 16, 1970, Ser. No. 89,770
Claims priority, application Switzerland, Nov. 20, 1969, 17283/69
Int. Cl. F16l *37/28*; F16k *17/38*
U.S. Cl. 251—149.7 6 Claims



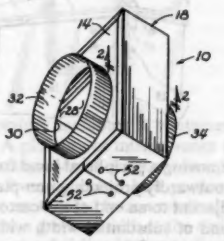
A coupling for connecting a thermal lance to an oxygen supply pipe having a casing with a valve therein held shut by a spring and the casing having an axial passage therein fitted with a pipe connection and a plunger therein slidable to open the valve, a clamping device is provided in the casing having at least one resilient ring-shaped member at that end of the hollow plunger which faces away from the valve and the clamping device adapted to receive the lance.

3,677,516
FAUCET
Glenn W. Hicks, 2749 North 75th St., Milwaukee, Wis.
Filed March 16, 1970, Ser. No. 11,748
Int. Cl. F16k *3/08*, *3/10*
U.S. Cl. 251—174 13 Claims



A faucet of the type for controlling the flow of fluids therethrough in which the rotational action of the faucet valve stem within the body of a faucet, together with limiting control of axial displacement of the valve stem, provides for control of fluid through the faucet, and wherein effective seal means between the valve stem and other fixed portions of the faucet are simplified and essentially free from wear, thereby eliminating the normal compression and wearing problems inherent in faucet construction.

3,677,517
WRAP-AROUND DAMPER FRAME
James R. Root, Independence, and Thomas D. Hill, Kansas City, Mo., assignors to Ruskin Manufacturing Company, Grandview, Mo.
Filed March 3, 1971, Ser. No. 120,650
Int. Cl. F16k *27/04*; F24f *13/08*
U.S. Cl. 251—366 10 Claims

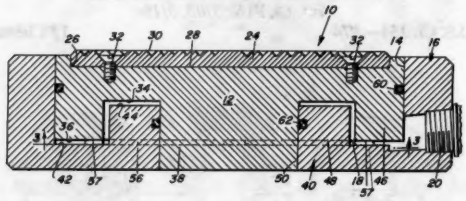


A damper comprises a housing which defines a control opening, and a foldable blade assembly disposed in the housing for selectively blocking the flow of fluid through the opening. The damper is adapted to be disposed in a fluid conduit, and a pair of planar members are disposed on either side of the housing, with each of the members being provided with a projecting flange which is of a configuration complemental to the configuration of the fluid conduit. An uninterrupted, unitary, U-shaped frame circumscribes the housing in gripping engagement with the planar members to provide a rigid damper assembly. The bight portion of the frame overlies the members with the housing sandwiched therebetween, and the leg portions of the frame form an angle of less than 90° with the bight portion to grip the members and present a rigid damper assembly.

3,677,518
HYDRAULIC JACK

Pieter Buys, Oldenzaal, Netherlands, assignor to Applied Power Industries, Inc., Milwaukee, Wis.

Filed Dec. 8, 1970, Ser. No. 96,131
Int. Cl. B66f 3/24
U.S. Cl. 254—93 R 4 Claims

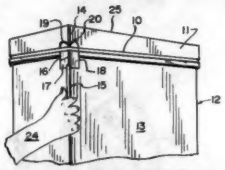


A short stroke hydraulic jack for lifting heavy loads. The jack comprises a piston and an open-ended cylinder of substantially equal length, which length is much greater than the length of the stroke of sad piston but much shorter than the respective diameter of the piston and cylinder. The piston is provided on one side with a load-bearing surface and on the other side with axially spaced concentric work surfaces and a centrally disposed shank. The cylinder has an end wall having a central opening therein for receiving said shank and axially spaced surfaces mating with the work surfaces of said piston whereby vertical surface-to-surface contact between the piston and cylinder is maintained in two radially spaced annular areas throughout the length of the stroke of the piston.

3,677,519
BAND REMOVER FOR CARTONS

Gerald E. Gast, Benton Harbor, Mich., assignor to Whirlpool Corporation

Filed Sept. 25, 1970, Ser. No. 75,418
Int. Cl. B66f 3/00
U.S. Cl. 254—131 8 Claims



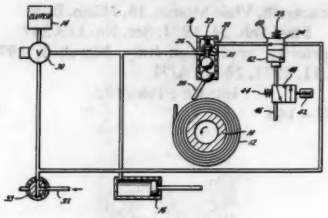
A tool for removing a peripheral band from a yieldable carton having an outwardly projecting non-planar area traversed by the band adjacent to an end of the carton in which the tool has a wedge end of substantial width with a lateral contour similar to the contour of this non-planar area, a fulcrum portion adjacent the end of the tool about which the tool is rockable and a handle attached to the wedge end for prying the band relative to the carton both in removing the band and applying the band to the carton once the wedge end of the tool has been inserted between the band and the carton.

3,677,520
SAFETY APPARATUS FOR DRILLING RIG

Paul C. Koomey, Houston, Tex., assignor to C. Jim Stewart & Stevenson, Inc., Houston, Tex.

Filed Feb. 1, 1971, Ser. No. 111,477
Int. Cl. B66d 1/48
U.S. Cl. 254—173 2 Claims

In an apparatus for preventing the traveling block of a drilling rig from being drawn into the top of the rig and having a toggle valve engaging the cable on a cable drum to control the rig brake and rig clutch, a manual safety override which allows longer lengths of drill pipe, drill collars or other special tools to be handled. A relay air valve normally allowing the passage of air to the toggle valve inlet for automatic operation



but when actuated closing the air supply to the toggle valve and venting the air from the toggle inlet, and a manually actuated second air valve for actuating the relay valve with spring means normally holding the second valve in the closed position whereby the operator must constantly hold the second valve in order to override the toggle valve automatic control.

3,677,521
SELF-TAILING PORTABLE CAPSTAN

Roger Kinnicutt, Jr., 50 Berwick St., Worcester, Mass.

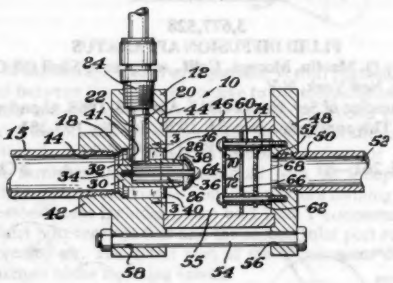
Filed March 13, 1970, Ser. No. 19,432
Int. Cl. B66d 1/26
U.S. Cl. 254—183 3 Claims

A self-tailing capstan for use in pulling and/or hoisting heavy loads or for tensioning lines, etc., includes a frame upon which first and second drums are rotatably mounted with their axes parallel. The first drum is rotatable in only one direction with reverse rotation being prevented typically by a ratchet and pawl assembly, while the second drum is freely rotatable in either direction. A detachable turning means such as a lever is provided the preferred embodiment of the invention to turn either drum as desired. In operation of the preferred embodiment, a flexible line is wrapped at least once around each drum. The length of line winding onto the two drums during hauling is defined as the "leading segment," and the length of line unwinding from the second drum is defined as the "tailing segment." The tailing segment always passes through a block attached either to the load or to a fixed anchor. The leading end of the line is attached to either the load or the anchor, ex-

cept when the frame itself is anchored, in which case the leading end passes through a block and then is attached to a block or blocks through which one or more parts of the tailing segment is passed. The frictional grasp of the line wraps around the second drum is greater than that of the wraps around the first drum so that reverse rotation of the second drum may release line tension or lower the load without disengagement of the first drum's ratchet and pawl assembly.

In a modified form of the invention, a differential driving assembly is provided to rotate the two drums simultaneously but at different circumferential speeds. The modified form of the invention may be employed with an endless line reeving to achieve an extremely high mechanical advantage.

3,677,522
FEEDER STREAM MIXER
Paul Hargash, Saginaw, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Dec. 2, 1970, Ser. No. 94,346
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 **7 Claims**

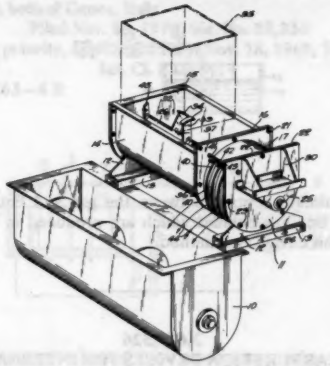


The invention relates to a device for dispersing, dissolving and/or mixing viscous materials which uses no power driven or moving parts. The device comprises an in-line chamber having an entry and exit end. There is an axially disposed baffled viscous material nozzle near the input and whereby the viscous material entering the chamber from said nozzle is sheared by solvent flow through the chamber. Baffle plates arrayed across the exit end result in turbulent flow and further mixing before the materials leave through the exit end.

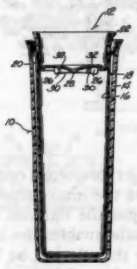
As the viscous material is pumped against an adjustable dished heat it emerges as a thin sheet which is sheared by the flow of solvents which flows through the sheet. Mixing is aided by turbulent flow in the device plus perforated baffle plates in the flow path through the device.

3,677,523
REBOUND PUG MILL
Nelson Hartley, Towson, Md., assignor to Hartley Controls Corporation, Neenah, Wis.
Continuation of Ser. No. 843,628, July 22, 1969, abandoned. This application April 29, 1971, Ser. No. 138,634
Int. Cl. B01f *7/04*
U.S. Cl. 259—69 **15 Claims**

A main pug mill or clay mixer has a rebound pug mill adjacent thereto. The rebound pug mill has a trough with an inlet for rebound material and an extruding head at the end of the trough with an outlet discharging into the main pug mill. Paddles in the trough comminute rebound material admitted through the inlet. Paddles in the extruding head extrude comminuted rebound material through the discharge outlet and into the main pug mill, thus to meter rebound material gradually into the main pug mill.



3,677,524
BEVERAGE CONTAINER
David Douglas, 1119 Lincoln Boulevard, Manitowoc, Wis.
Filed Sept. 29, 1970, Ser. No. 76,555
Int. Cl. A47J *43/27*
U.S. Cl. 259—72 **2 Claims**

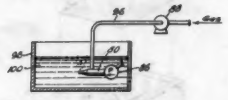


A beverage container including a container and a cover member therefor. A plurality of mixing vanes are formed integrally with the bottom face of the cover member and extend radially outwardly from a central hub portion to outer end portions. The vanes are tapered from a relatively narrow width at the hub portion to a greater width at the end portions. The vanes serve to impart a swirling action to liquid in the container when the container is moved rapidly up and down.

3,677,525
PRESSURE WAVE ATOMIZING APPARATUS
Robert E. Schurig, Maywood, and Joseph Korn, Fort Lee, both of N.J., assignors to Sonic Development Corporation of America, Yonkers, N.Y.
Continuation-in-part of Ser. No. 699,109, Jan. 19, 1968, abandoned. This application Dec. 31, 1969, Ser. No. 889,596
Int. Cl. B01f *3/04*
U.S. Cl. 261—1 **2 Claims**

The liquid preferably is a body of liquid in a container. A liquid is forced through a converging-diverging nozzle towards a nearby resonator cavity, and the gas is introduced into the

flowing liquid before it reaches the cavity. Preferably, the nozzle and resonator cavity both are immersed in the body of



liquid. Intimate contact between the gas and liquid results from the tiny gas bubbles which are produced in the liquid body by this device and method.

3,677,526

CARBURETION DEVICES FOR INTERNAL COMBUSTION ENGINE

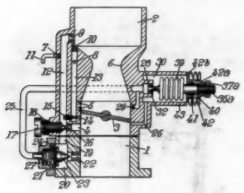
Michel Eugene Pierlot, Le Pecq, France, assignor to Societe Industrielle de Brevets et D'Etudes S. I. B. E., Neuilly-sur-Seine, France

Filed Feb. 26, 1970, Ser. No. 14,456

Claims priority, application France, March 3, 1969, 6905748; Sept. 30, 1969, 6933379

Int. Cl. F02m 7/22

U.S. Cl. 261—23 A **6 Claims**



The device has a main jet for normal operation and an idling circuit, both opening into the intake pipe and provided with calibrated orifices to adjust the richness of the air/fuel mixture. An adjustable throttle enables the idling mixture to be adjusted. The adjustable throttle can be bypassed through a passage to the mixing channel during deceleration. The passage has a closing member actuated by a capsule governed by the suction in the intake and by a member sensitive to the engine's speed. When the bypass is closed the capsule is connected to atmospheric pressure. The capsule is fixed to an element compensating for altitude.

3,677,527

HUMIDIFICATION EQUIPMENT FOR GASES

Dag Olof Alfred Johannisson, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

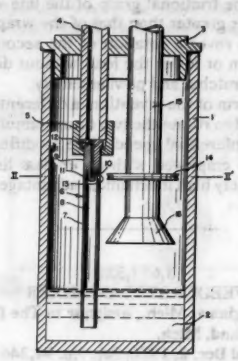
Filed April 15, 1970, Ser. No. 28,737

Claims priority, application Sweden, April 17, 1969, 5404/69

Int. Cl. B01f 3/04

U.S. Cl. 261—76 **3 Claims**

A humidifier for gas comprising a liquid tank, gas inlet means projecting axially into a liquid introducing means for sucking in of liquid, said liquid introducing means having a larger inside cross-sectional area than said gas inlet means, said gas inlet means and liquid introducing means having a common radial opening through which the gas supplied can be blown out together with the sucked in liquid as a gas jet con-



taining liquid particles, and a diffuser arranged in the tank opposite said common radial opening for the dividing of the liquid particles in said gas jet.

3,677,528

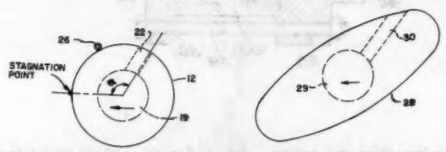
FLUID DIFFUSION APPARATUS

Godfrey Q. Martin, Moraga, Calif., assignor to Shell Oil Company, New York, N.Y.

Continuation of Ser. No. 724,043, April 25, 1968, abandoned. This application Dec. 31, 1970, Ser. No. 103,281

Int. Cl. B01f 3/04

U.S. Cl. 261—87 **2 Claims**



Apparatus for entraining a light fluid into a denser fluid. A substantially hollow vessel is provided which is adapted to contain therein the denser fluid. A rotatable drive shaft having impeller means arranged at its lower end is disposed within the vessel. Both the drive shaft and the impeller means have interconnecting passageway means. The drive shaft passageway means includes light fluid inlet means whereas the impeller means passageway means includes aperture means transverse to and in communication with both its passageway means and the interior of the vessel. The aperture means are also spaced radially outwardly of the drive shaft. As the impeller means is rotated by means of the drive shaft, the lighter fluid is passed from the fluid inlet means through the drive shaft and out of the aperture means whereby the lighter fluid is entrained in the denser fluid within the vessel.

3,677,529

LIQUID FUEL AND AIR MIXTURE CHARGE FORMING DEVICE

Mary Zane Johnson, 212 N.E. 26th St., Miami, Fla.

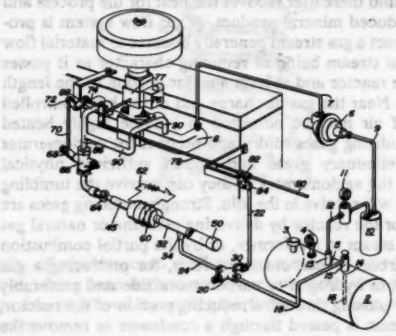
Filed Jan. 17, 1968, Ser. No. 698,507

Int. Cl. F02m 9/08, 13/00, 37/12

U.S. Cl. 261—129 **7 Claims**

A charge forming device for increasing the combustibility of a volatile fuel including a valve unit for mixing compressed air and fuel. The resultant mixture is conducted along a path in-

cluding metering valves responsive to a throttle setting. The mixture flow is subjected to heat and then metered through a valve responsive to the temperature of the heated mixture. The resultant metered fuel mixture is then injected into the intake manifold of an internal combustion engine, the latter including an independent parallel path of forced air. A vacuum actuated air compressing pump compresses the air to a preselected pressure and the intake of the pump is connected to the intake manifold. The exhaust of the pump is connected to a compressed air storage tank and the tank includes an exhaust port. A pressure regulator is connected to the exhaust



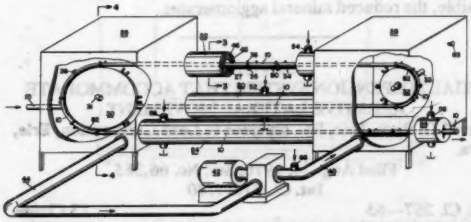
port of the storage tank. An adjustable verturi regulator is inserted between the valve responsive to the temperature of the mixture and one of the metering valves. A second embodiment of the present device includes the aforementioned construction in addition to a conventional carburetor system which furnishes the intake manifold with an independent parallel supply of carbureted fuel. The mixture forming unit in this embodiment includes a two port inlet T-connector. The first inlet port receives fuel and the second inlet port receives compressed air. The outlet port of the T-connector delivers the mixture to the metering valves.

3,677,530

OVEN FOR HEATING CONTINUOUS TUBING

Richard MacDuff, Newark, and Paul M. Stewart, Pembrey, both of Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed Feb. 10, 1971, Ser. No. 114,164
Int. Cl. F27b 9/28
U.S. Cl. 263—3 **17 Claims**



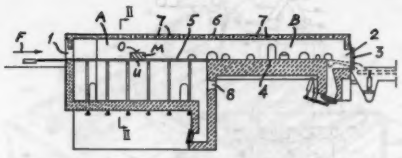
A multiple pass oven for heating continuous tubing of a thermoplastic polymer prior to orienting the same comprises an inlet chamber, an exit chamber and at least three conduits interconnecting the chambers. Rotatable wheels are provided in each chamber and spaced guide members are located in the conduits and on the peripheral edge of the wheels for receiving the tube therein. The guides are so designed that practically speaking the entire tube is at all times exposed to turbulent hot air circulating from the exit chamber through all of the conduits to the inlet chamber.

3,677,531

METHOD FOR HEATING METAL SLABS OR BILLETS IN CONTINUOUS PUSHER-TYPE FURNACES

Carlo Pere, 2 Via Mura del Prato, and Fulvio Tornich, 18 Via Bottini, both of Genoa, Italy

Filed Nov. 10, 1970, Ser. No. 88,324
Claims priority, application Italy, Nov. 18, 1969, 7454 A/69
Int. Cl. F27b 9/14
U.S. Cl. 263—6 R **6 Claims**



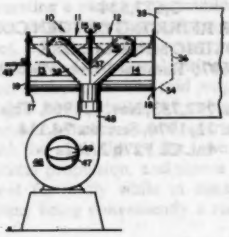
Metal ingots are heated in a continuous pusher-type furnace. In a heating zone the upper and lower surfaces of the ingots are heated differently so that in the initial stages of a soaking zone following the heating zone, the surface temperature of the upper surface of the ingots is above, and the surface temperature of the lower surface is below, the required ejection temperature of the ingots. In the soaking zone no heat is applied to the lower surface while some heat is applied to the upper surface and heat flow occurs through the center of the ingot from the upper to the lower surface.

3,677,532

TWO CHAMBER FUEL BURNER

John J. Wolfersperger, 21 Strawberry Circle, Mill Valley, Calif.

Division of Ser. No. 806,357, March 12, 1969, Pat. No. 3,539,284. This application July 6, 1970, Ser. No. 60,987
Int. Cl. F23l 9/04
U.S. Cl. 263—19 A **5 Claims**

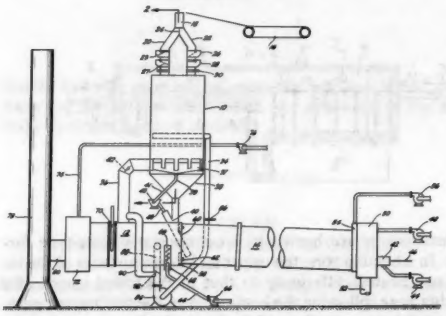


This two-chamber burner delivers completed combustion. Two flanged housings are joined together, one for each chamber, and both chambers have long narrow rectangular tangential air inlets into their cylindrical housing. The first chamber has a fuel inlet for gas or oil and a first cylindrical baffle spaced axially from the end wall and radially from the housing to provide an annular air inlet chamber. Air scoops connect air from the space between the housing and baffle into the interior space inside the baffle. When using oil as the fuel, a second baffle is spaced near the end of this first baffle, with an overlap, and is of greater diameter. It terminates near a first conical shell that leads into a second chamber, where it is surrounded by a further cylindrical baffle, also spaced from the housing to provide an annular chamber, into which the air inlet for that chamber opens. This further baffle terminates near a second frustoconical shell that leads into a boiler or other such device.

3,677,533
METHOD OF USING A COKE PREHEATER

Robert K. Olover, San Luis Obispo, and George L. Ford, Arroyo Grande, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Feb. 8, 1971, Ser. No. 113,122
Int. Cl. F27b 7/02
U.S. Cl. 263—52 9 Claims

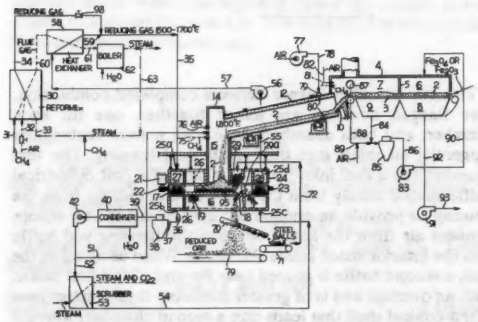


A method is described for preheating coke in a calcining process to a temperature between about 600° to 850° F. This preheating avoids shattering of the coke into undesirable small particles in the calcining kiln. The hot combustion gases from the kiln are admixed with air to burn all volatile combustible material contained in the gases and a portion of the resultant hot gases is admixed with cooler recycle gas from the preheater to obtain a heating gas for the preheater having a temperature between about 800° and 850° F. This heating gas is supplied to the preheater in sufficient volume to preheat the coke to above about 600° F. The coke is passed through the preheater and kiln at the kiln capacity feed rate, sufficient to provide a coke residence time in the kiln no greater than about 54 to 58 minutes.

3,677,534
APPARATUS FOR REDUCING OXYGEN CONTENT OF OXIDIC MINERAL ORE

Robert D. Frans, 16075 Ramona Drive, Middleburg Heights, Ohio

Division of Ser. No. 772,753, Nov. 1, 1968. This application Sept. 21, 1970, Ser. No. 74,114
Int. Cl. F27b 21/02
U.S. Cl. 266—20 18 Claims



A system with several variations is disclosed for reducing the oxygen content of mineral ore. The preferred embodiment of the system includes first, in mineral flow sequence, a preliminary traveling grate apparatus for drying and preheating agglomerates of finely divided mineral ore. Next, a rotary kiln is provided to further heat the agglomerates in a reducing atmosphere and preferably at least initiate the relatively more easily accomplished reducing steps which in the case of iron ore is the reduction of Fe_2O_3 or Fe_3O_4 to FeO. After the kiln, a reactor apparatus preferably having a horizontal annular rotary grate is provided to perform additional steps, which in the case of iron ore is the more difficult reducing step of reducing FeO to Fe, form a network of metal bridges throughout the agglomerates to provide agglomerate strength and degradation resistance, and thereafter recover the heat for the process and cool the reduced mineral product. A gas flow system is provided to direct a gas stream generally counter to material flow with the gas stream being of reducing character as it passes through the reactor and at least a major portion of the length of the kiln. Near the gas discharge end of the kiln controlled amounts of air may be admitted to provide highly heated strongly oxidizing gases to dry and preheat the agglomerates on the preliminary grate and impart sufficient physical strength to the agglomerates so they can survive the tumbling action they will receive in the kiln. Strongly reducing gases are provided for the reactor by delivering methane or natural gas along with steam to a reformer, or by the partial combustion of hydrocarbon or carbonaceous fuels, for producing a gas stream rich in hydrogen or carbon monoxide and preferably both. After passing through a reducing portion of the reactor, the gas stream is passed through a condenser to remove the water formed by the reducing action of the hydrogen, and the gas stream is then divided into two separate branch streams with a first branch being directed to flow through the kiln. A second branch stream is directed through a carbon dioxide scrubbing system to scrub out CO_2 formed by the reducing action of the CO; after which this gas stream is passed through a heat recovery and cooling portion of the reactor to recover heat for the process by heating the gas stream and cooling the reduced mineral product. The second branch gas stream which then has itself been heated by the agglomerate cooling operation, may be further heated, indirectly, by reformer flue gases, and thereafter have admixed with the second branch gas stream, fresh rich reducing gas from the reformer to provide a combined heated gas stream for passing through the reducing portion of the reactor. A layer of heat transfer media, such as steel balls, are provided to form a bed on the annular grate beneath the mineral ore agglomerates, to provide for the recovery of heat for the process by temporarily storing heat in the media while the gas stream is passed through a condenser and carbon dioxide scrubbing system, after which the gases again pass through the media on the annular grate to recover heat stored in the media and then recover additional heat for the process by cooling, to extent possible, the reduced mineral agglomerates.

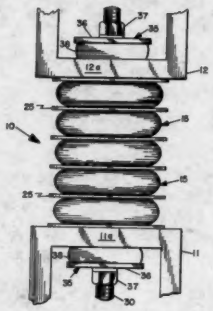
3,677,535
AXIAL SUSPENSION SYSTEM THAT ACCOMMODATE RELATIVE LATERAL MOVEMENT

Merrill G. Beck, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Aug. 24, 1970, Ser. No. 66,365
Int. Cl. F16f 1/40
U.S. Cl. 267—63 13 Claims

A plurality of superimposed precompressed resilient pad means are disposed between normally axially spaced support and supported members. An elongate guide member is operatively disposed through the superimposed resilient pad means for maintaining alignment therebetween and is operatively associated with the support and supported members for permitting relative axial, lateral and axially out-of-parallel movement therebetween. The resilient pad means are alternatively compressible and expandable in response to relative axial or axially parallel movement between the support and supported members for absorbing substantially all of such relative movement therebetween while cooperating with the guide member

and support and supported members for permitting relative lateral and cocking or axially out-of-parallel movement between the support and supported members. Each of the plu-



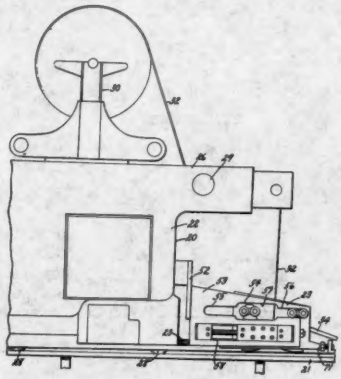
rality of superimposed resilient pad means are so constructed as to have a load-deflection rate which increases with load to provide improved operating performance of the suspension system.

3,677,536

SLACK FORMING DEVICE FOR CLOTH LAYING MACHINES

Stephen Paterson, Forest Hills, N.Y., assignor to Cutting Room Appliances, New York City, N.Y.

Filed May 27, 1970, Ser. No. 40,819
Int. Cl. B65h *29/46*
U.S. Cl. 270—31 **5 Claims**



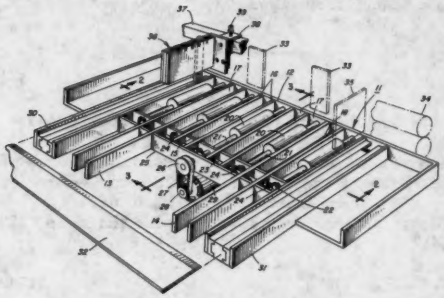
Improved slack-forming means for use in conjunction with a cloth laying carriage having a positively driven web feed roller to provide additional cloth web links at the completion of an end fold, particularly when laying cloth having an excessive tendancy to stretch under tension. The improved structure includes the mounting of known fold forming bars for relative longitudinal movement with respect to the carriage. Means is provided on the cloth laying table for arresting movement of the bar structure prior to the arresting of the carriage at the end of each cloth laying cycle, so that with the additional movement of the carriage, the positively driven roller continues to feed a short length of cloth web to thereby provide necessary slack for performing a uniform fold.

3,677,537

APPARATUS AND METHODS FOR FEEDING SHEETS OF MATERIAL FROM STACKS WITH ONE SIDE IN VERTICAL REGISTRATION

William C. Hawthorne, 218 Phelps Road, Ridgewood, N.J.

Filed March 26, 1971, Ser. No. 128,480
Int. Cl. B65h *1/06, 3/08*
U.S. Cl. 271—29 **8 Claims**



Apparatus and methods for feeding sheets of material from stacks with one side in vertical registration wherein the method comprises stacking the sheets flat on a generally horizontal support with the bottom of the lowermost sheet in contact with lateral propulsion means, exerting a vacuum on the lowermost sheet from beneath sufficient to significantly increase the force of contact between the lowermost sheet and the said lateral propulsion means and preferably sufficient to deflect the lowermost sheet around the propulsion means to a limited degree, simultaneously propelling the lowermost sheet from beneath by the propulsion means laterally against a side guide and thereafter propelling the lowermost sheet forwardly while in contact with the side guide.

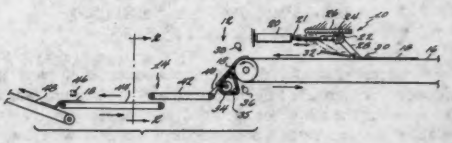
The apparatus comprises a generally horizontal support having at least one vacuum chamber open at the top of the support, the support and chamber conveniently being defined by a plurality of spaced apart, generally upstanding flat bars, means for generating a vacuum communicating with the said chamber, power driven lateral propulsion means in proximity to the chamber, said propulsion means projecting above the top of the support and engageable with the bottom of the lowermost sheet of the stack. The said propulsion means conveniently being a power driven rotatable roller positioned within the chamber between spaced apart bars, a side guide engageable with the side edge of the lowermost sheet in the direction of lateral propulsion, and means for propelling the lowermost sheet forwardly while in contact with the side guide, said means being conveniently a reciprocating feeder bar.

3,677,538

AUTOMATIC DOFFER FOR ARTICLES ADHERED TO A CONVEYOR BELT

Thomas M. Wall, Halawaka Creek, Ala., assignor to West Point-Pepperell Inc., West Point, Ga.

Filed Aug. 31, 1970, Ser. No. 68,079
Int. Cl. B65h *29/16*
U.S. Cl. 271—76 **7 Claims**



Method and means for automatically transferring articles

from a conveyor belt when the articles are adhered thereto. The articles are shown as being flat and flexible or drapable. The adhesion between the belt and the leading edge of the article is first automatically broken and then the separated leading edge is pulled and guided away from the end of the conveyor. Special exemplary means are disclosed which include a reciprocating blade for breaking loose the leading edge and interleaved doffer belts and guide combs for pulling and guiding the articles from the belt. Pressurized gases may also be blown under the separated leading edge and onto the trailing edge for facilitating the operations.

3,677,539

BUOYANT AQUATIC AMUSEMENT DEVICE WITH REINFORCING COVER

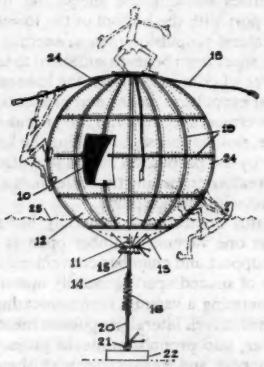
Maureen Constance Bennet, Ste. #104, 1124, Meadowlands Drive, Ottawa, Ontario, K2E-6H9, Carleton, Canada

Filed Aug. 5, 1970, Ser. No. 61,083

Claims priority, application Canada, March 19, 1970, 77,817

Int. Cl. A63g *31/12*

U.S. Cl. 272—1 B 2 Claims



A spherical, inflated elastic body enclosed in an inelastic cover. The body has ropes dangling downwardly from its top and also has a network of cords disposed on the exterior surface of the cover. The cord network provides finger holds and toe holds which, along with the dangling ropes, assist a person in climbing out of the water onto the top of the body.

The bottom of the body is connected to a mooring line which is secured through a tension spring to an anchor block.

3,677,540

MATERIAL DISCHARGE CONTROL APPARATUS

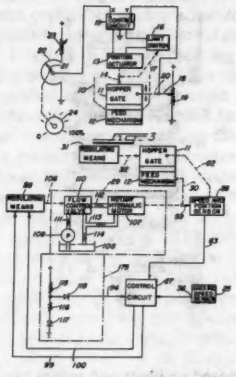
Paul C. Weiss, Evanston, Ill., assignor to Ambac Industries Incorporated, Garden City, N.Y.

Filed April 21, 1969, Ser. No. 817,837

Int. Cl. B67d *5/08*

U.S. Cl. 222—23 16 Claims

Discharge of material from the hopper of a vehicular spreader is determined by the opening of the hopper gate and the speed of the conveyor or auger feed mechanism. By interrelating the apparatus for controlling the gate with the apparatus for regulating the feed mechanism the engine or motor driving the latter can be caused to operate within its optimum range. The gate position can be controlled automatically or manually; in the latter case the operator is provided with an



appropriate signal defining the optimum range. The apparatus is also ground speed responsive for maintaining a constant selectable discharge rate.

3,677,541

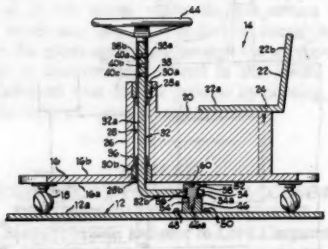
CHILD'S OCCUPANT PROPELLED RIDING TOY ROUNDABOUT

Andras Race, Chicago, Ill., assignor to Marvin Glass & Associates

Filed Dec. 15, 1970, Ser. No. 98,292

Int. Cl. A63g *1/12*

U.S. Cl. 272—33 R 1 Claim



An amusement device of the type including a movable seating apparatus rotatably mounted on a platform, characterized by the provision of a steering mechanism on the seating apparatus, with the steering mechanism eccentrically rotatably mounted to the platform.

3,677,542

HOCKEY STICK

Andre Michaud, 1545 Caron St., Sherbrooke, Quebec, Canada

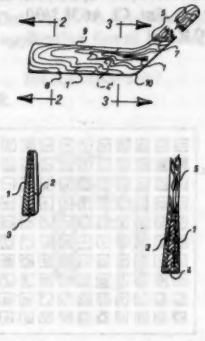
Filed May 11, 1970, Ser. No. 39,191

Int. Cl. A63b *59/12*

U.S. Cl. 273—67 A 7 Claims

A hockey stick in which the end of the handle adapted to be

joined to the blade, forms a wedge and the blade is made of two laminations or plies overlapping the handle wedge, resulting in a stronger joint and easier and less expensive manufacture of the hockey stick.



3,677,543

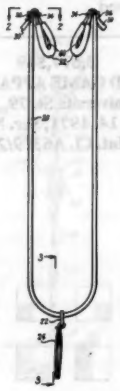
ELASTIC PULL TYPE EXERCISER

John H. Richardson, 222 Gerrymander, Sonora, Calif.

Filed Sept. 30, 1970, Ser. No. 76,748

Int. Cl. A63b *23/02, 23/04, 21/00*

U.S. Cl. 272—82 **1 Claim**



A pull type exercising device including a single piece of elastic tubing with loops formed at the respective ends of the tubing by S-shaped hooks that receive folded ends of the tubing. On each looped portion of the tubing there is a sleeve. A slidable ring with an anchoring attachment is mounted on the tubular member. A use inserts an arm or leg in the loops and pulls on the anchored tubular member.

3,677,544

BASEBALL PRACTICE DEVICE

Walter E. Meyers, 9141-4th Ave, South, Minneapolis, Minn.; Richard D. Meyers, 7544-17th Ave, South, Minneapolis, Minn., and Warren H. Meyers, 5550-38th Ave, South, Minneapolis, Minn.

Filed April 9, 1970, Ser. No. 27,048

Int. Cl. A63b *69/00*

U.S. Cl. 273—26 D **6 Claims**

Baseball batting device for sequentially delivering baseballs to a hitter for batting practice and comprising ball storage tubes for retaining a plurality of baseballs for sequential introduction into a baseball delivery apparatus wherein the baseball delivery apparatus intermittently receives baseballs from the ball storage tubes so as to intermittently drop the baseballs to the hitter. The delivery apparatus includes a ball receiving member journaled for axial rotation along a point disposed adjacent the storage tubes, the delivery tubes being provided with at least one ball receiving socket formed as a radially extending cavity therein for receiving and dispatching baseballs therefrom. In addition, a mount is provided for positioning the baseball batting practice device in elevated disposition for gravitational dropping of baseballs from the delivery apparatus.

3,677,545

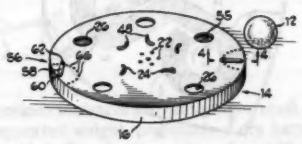
VISUAL AND AUDIBLE SIGNAL PRODUCING TARGET APPARATUS

Jeffrey Dale Breslow, Chicago, Ill., assignor to Marvin Glass & Associates

Filed Feb. 10, 1970, Ser. No. 10,251

Int. Cl. A63b *63/00*

U.S. Cl. 273—102.1 C **8 Claims**



A game device of the type employing a target-like element and a ball to be thrown thereat, characterized by spring biased movable audible signal striking arms underlying the target area cover and having color coded target portions movable away from a position underlying openings in the cover when struck and the signal striking arms engage a signal element responsive to contact of the colored target portions by a thrown ball.

3,677,546

IMPENETRABLE AUTOMATICALLY REGISTERING TARGET

Hermann Walter Oetiker, Oberlunkhofen, Switzerland, assignor to Polytronic SA, St-Aubin NE, Switzerland

Filed March 26, 1970, Ser. No. 22,806

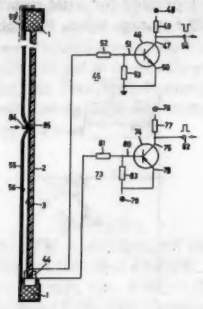
Claims priority, application Switzerland, March 27, 1969, 4901/69

Int. Cl. F41j *5/04*

U.S. Cl. 273—102.2 R **7 Claims**

The present invention relates to the field of shooting techniques and particularly to automatically working shooting targets. The invention concerns a shooting target comprising essentially an electrically conducting sheet or plate and an

electrically conducting elastic membrane placed in a predetermined relationship in front of the said conducting sheet or



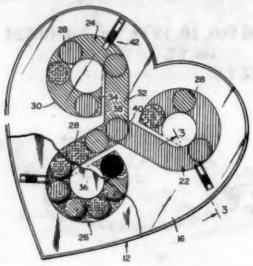
plate, said conducting sheet and membrane being insulated each from the other and being each electrically connected to at least one terminal mounted on the target.

3,677,547

PUZZLE WITH MULTIPLE PASSAGEWAYS HAVING A COMMON INTERSECTION AND OBJECTS SHIFTABLE AMONG SAID COMPARTMENTS

Alan A. Hicks, Weston, Conn., assignor to Kohner Bros., Inc., East Paterson, N.J.

Filed Nov. 9, 1970, Ser. No. 87,997
Int. Cl. A63f 7/04
U.S. Cl. 273—109 **13 Claims**



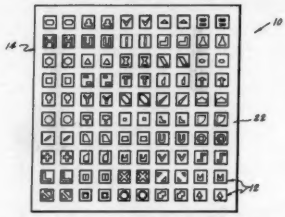
A puzzle comprising several passageways. The distal ends of the passageways are closed and retroverted. The proximal ends of the passageways meet at a common intersection. The passageways contain shiftable objects such as spheres which are individually wider than half the width of the passageways so that there never can be two objects abreast in a passageway. The number of objects does not exceed the total number of objects that can be accommodated in all but one passageway. By way of example in a typical puzzle with three passageways, each long enough to contain eight objects, there are 16 objects in all. The objects are characterized, as by color, in a fashion such that they can be subdivided into groups equal in number to the number of passageways with the solution of the puzzle consisting of shuttling the objects into and out of the passageways through the intersection until there is a different group of objects of like character in each different passageway. Thus, with three passageways and 16 objects, there may be five objects, each of three different colors, to be arranged for correct solution by manually tilting the puzzle so that five similarly colored objects are situated in each different passageway with the sixteenth differently colored object situated at the intersection. Each of the passageways may have a slide gate to selectively retain objects in any passageway in order to facilitate solving of the puzzle.

3,677,548

BOARD GAME APPARATUS

Thomas W. Hincz, 1207 Farmstead, Wichita, Kans.

Filed Nov. 2, 1970, Ser. No. 85,926
Int. Cl. A63f 3/00
U.S. Cl. 273—130 R **6 Claims**



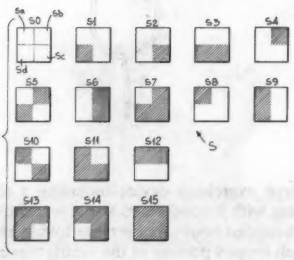
Game apparatus including a game board with a plurality of receptacles therein, and a plurality of sets of playing pieces, each set having a plurality of like playing pieces. The playing pieces fit in the receptacles in the game board, and each set of playing pieces has a different geometrically shaped portion on one side thereof than the other sets and a handle on the opposite side. The game is played by selecting two of the playing pieces from the game board, examining them to determine if like ones have been selected then replacing them if not, or retaining them if matched.

3,677,549

BOARD GAME APPARATUS

Ivan Moscovich, Ha. Universita St. 79,, Ramat Aviv, Israel

Filed June 14, 1971, Ser. No. 152,520
Int. Cl. A63f 9/20
U.S. Cl. 273—135 R **6 Claims**



A board game of educational value in familiarizing the player with the binary-system, comprises a playing board and a set of identically-shaped playing pieces, each playing piece having "*n*" (e.g. 4) equal sides and being divided into "*n*" equal parts. The parts of the playing pieces are colored in two distinctive colors providing 2^n possibilities of color-part combinations, each set including a playing piece for each of the 2^n color part combinations. The playing board includes markings dividing the board into a plurality of at least 2^n divisions, each division having an external shape identical to that of the playing pieces. Each playing piece represents a value in the binary-system of notation according to the position played on the board.

3,677,550
CHESSMEN
Ronald Alexander Mathers, 4 Naplershall St., Glasgow, N. W., Scotland
Filed Oct. 26, 1970, Ser. No. 83,887
Claims priority, application Great Britain, Dec. 11, 1969, 60,431/69
Int. Cl. A63f 3/02
U.S. Cl. 273—137 R 1 Claim

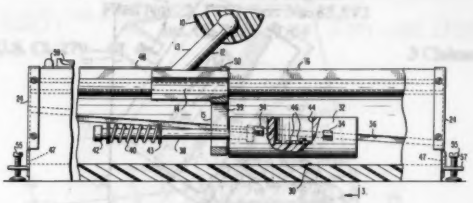
Each piece in a set of chessmen, other than the kings, has a uniform cross-sectional shape which is linearly symbolic of its permitted mobility on a chessboard.

3,677,551
GOLF TRAINING DEVICE
Douglas I. Schaus, 462 Hilltop Road, Elgin, Ill.
Filed July 26, 1971, Ser. No. 165,965
Int. Cl. A63b 69/36
U.S. Cl. 273—183 B 7 Claims

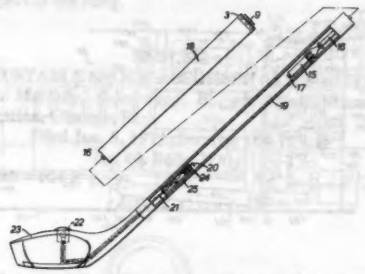
The device of the present invention is intended to assist in developing the correct swing of a golf club. Briefly, the device includes a base plate for locating or positioning the feet, a loop adapted for encircling the neck and a flexible link between the base plate and neck loop. The flexible link includes a pulley to hold the loop, a swivel and an adjustable break-a-way coupling which may be in the form of interlocking male and female parts, held together by magnetic attraction, which will disengage if an incorrect golf swing occurs.

3,677,552
GOLF PRACTICE APPARATUS
August R. Werft, 233 Dixon Blvd., Uniontown, Pa.
Filed June 25, 1971, Ser. No. 156,683
Int. Cl. A63b 69/36
U.S. Cl. 273—184 B 18 Claims

Apparatus permitting the playing within a small area of a simulated game of golf. A golf ball is connected by a tee assembly to a torpedo within an elongated housing. In one embodiment, the torpedo carries weights, and when the golf ball is struck the torpedo moves up a uniform grade within the housing to slow the torpedo. In a second embodiment, the torpedo carries magnets and the housing includes oppositely-poled magnets so that as the torpedo carries its magnets over those of the housing, the magnetic attraction slows the torpedo. The distance the ball and torpedo move is scaled to indicate the distance which would have been achieved by a freely hit ball on a golf course. A calibration unit includes a weight for striking the ball a fixed blow to move it a fixed distance.



3,677,553
PRACTICE GOLF CLUB
Eric Desmond Moore, 11 Stanmore Hill, Stanmore, England
Filed Sept. 14, 1970, Ser. No. 71,957
Claims priority, application Great Britain, Oct. 3, 1969, 48,658/69
Int. Cl. A63b 69/36
U.S. Cl. 273—186 A 5 Claims

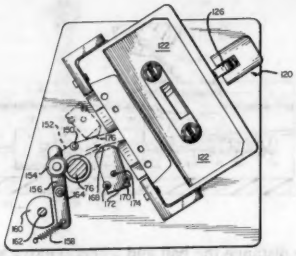


The invention consists in providing in the shaft of a golf club a spring supported weight, preferably a dry battery, which is slidable in said shaft under the action of centrifugal force and against the action of said spring attached thereto to cause said weight to engage an electric contact in the circuit of a lamp bulb mounted in the club head to cause said lamp to light up during the swinging of said club. The spring to which the battery is attached is carried by a rod which may be axially adjusted within a guide sleeve in the shaft of the club by rotating an adjusting knob mounted on the end of said shaft by means of a friction plug and fixed to a screw connected to axially displace said rod when said knob is rotated. The electrical contact is mounted on an insulating plug in said shaft at a point spaced from the battery.

3,677,554
DUPLICATING APPARATUS FOR CASSETTES
Francis Rawdon Smith, Maple Tree Farm, Box 216, Peters Rd., Frederick, Md., and John E. Horne, 6001-34th Ave., Hyattsville, Md.
Filed July 16, 1970, Ser. No. 55,419
Int. Cl. G11b 5/86
U.S. Cl. 274—3 21 Claims

Apparatus for fast, high quality duplication for magnetic tape in cassettes, having mounts for the cassettes with openings for a loop of tape to extend out from each cassette and to be positively driven. The loop is positioned around a

short idler and the idler is then biased against a drive mandrel common to all stations in the apparatus. At each station a



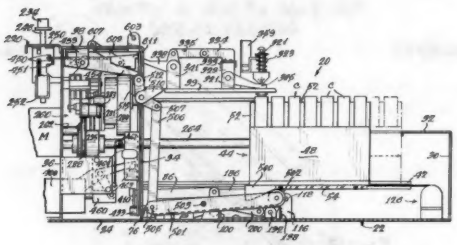
transducer is located past the drive mandrel shortly ahead of the location at which the looped tape re-enters the opening of the mount.

3,677,555

CASSETTE CHANGER

Thomas W. Vail, Des Plaines, and Allen L. Ryan, Chicago, both of Ill., assignors to Warwick Electronics, Inc.

Filed Nov. 21, 1968, Ser. No. 777,689
Int. Cl. G11b 27/22, 23/12
U.S. Cl. 274—4 F **10 Claims**



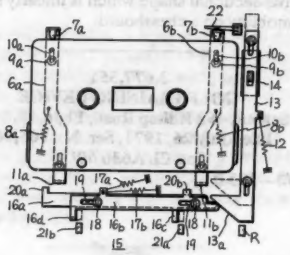
A cassette changer having a plurality of elements for either record or playback operation relative to a tape and defining a tape path wherein a holder for a plurality of cassettes can be indexed sequentially to bring successive cassettes into position to have a portion of the tape carried thereby in line with the tape path and with a capstan for driving the tape along with a pair of spindles extending through the reels of each cassette and having driving engagement with one reel of a cassette in playing position. The operations are primarily controlled by a main control member movable through two different strokes with a full stroke thereof causing retraction of cassette probe means, disengagement of the drive to the driven one of the spindles, lifting of certain of the head and transport components away from the tape, and indexing of the cassette holder. Movement of the main control member through less than a full stroke, as required in pause, fast-forward, and rewind operations, causes the foregoing operations except for indexing of the said holder. The main control member is moved through a full stroke by power means which can be operated by either of a reject switch, an end-of-tape sensor switch, or a record interlock switch when a tape appearing at playing position to be recorded upon is actually pre-recorded. The main control member can be moved through less than a full stroke by operation of either a stop member or last cassette shut-off mechanism, or by actuable elements, such as buttons, operable to provide the pause, fast-forward, and rewind operations, with the first two mentioned operations operating through the power means but interposing an abutment in the path of the main control member to limit the main control member to the shorter stroke. The probe has three distinct positions to detect either a pre-recorded tape cassette, a non-recorded tape cassette, or the absence of a cassette, with the last-referred to position causing further operation of the indexing means. The drive for the reel spindles is by means of an idler wheel system, with the first normally operative idler wheel being movable from an operative position causing normal speed operation of the tape, a second optionally operative idler wheel providing for fast-forward operation, and a third optionally operative idler wheel providing for rewind operation, and with the first idler wheel always being disengaged by the main control member upon movement thereof.

3,677,556

MAGNETIC RECORDING AND REPRODUCING DEVICE

Koozo Oosone, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 11, 1969, Ser. No. 832,233
Claims priority, application Japan, June 13, 1968, 43/40716
Int. Cl. G11b 27/24
U.S. Cl. 274—4 C **9 Claims**



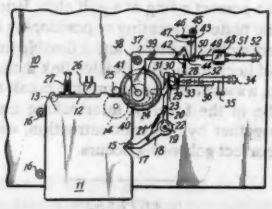
An auto-reverse type magnetic recording and reproducing device for Philips type cassettes which has means for detecting faulty-erasure-preventing means provided in the cassettes so as to avoid faulty erasure of recorded signals on the tape during recording not only in a forward direction but also in a reverse direction.

3,677,557

ENDLESS MAGNETIC TAPE CARTRIDGE REMOVING APPARATUS

Itsuki Ban, 829 Higashi-Oizumimachi, Nerima-ku, Tokyo, Japan

Filed March 30, 1970, Ser. No. 23,537
Int. Cl. G11b 5/00
U.S. Cl. 274—4 B **10 Claims**



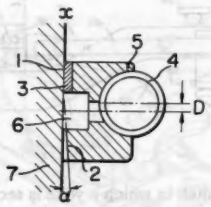
An apparatus moving a cartridge to and from a play position in a tape cartridge player comprising a displaceable member supporting a retension member which is engageable with a notch in the cartridge and which exerts a forward force to the cartridge for holding the cartridge in the play position with respect to the capstan and the magnetic head, and means for moving the displaceable member to the position where the retention member escapes from the notch of the cartridge, the cartridge being removed from the play position as said forward force on the cartridge is extinguished by the retention member escaping from the notch of the cartridge.

3,677,558

OIL STRIPPING PISTON RING

Eisuke Sugahara, Tokyo, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1971, Ser. No. 114,552
Int. Cl. F16j 9/06
U.S. Cl. 277—138 4 Claims



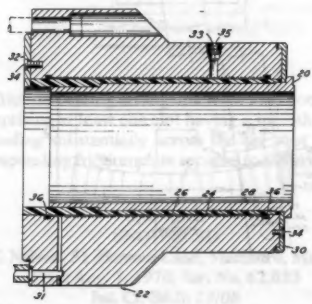
An oil stripping piston employed on an internal combustion engine, especially aimed at elevated contact pressure and drastic reduction of lubrication oil consumption, on which a hardened surface is provided either on the top or bottom rubbing surface of the oil stripping piston ring and on the back of said oil stripping piston ring. An expander is mounted in the position selected for even distribution of rubbing wear of the hardened surface and the base material of the piston ring for maintaining a constant wear step between the said two rubbing surfaces.

3,677,559

HYDROSTATIC HOLDING DEVICE

Eugene R. Andre, and John M. Rautio, both of 12024 East Nine Mile Rd., Warren, Mich.

Continuation-in-part of Ser. No. 736,840, June 13, 1968, abandoned. This application Jan. 19, 1971, Ser. No. 107,817
Int. Cl. B23b 31/10
U.S. Cl. 279—1 Q 7 Claims



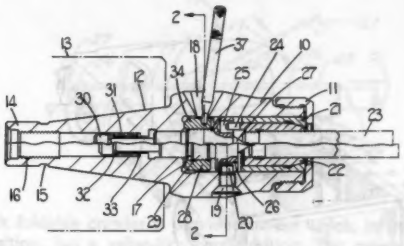
A hydrostatic holding device which employs a relatively thin wall sleeve in either internal or external holding units and utilizing a sleeve of pliant material such as nylon which is relatively soft compared to metal parts which are to be clamped, the concept being a sleeve material which will conform to the surface conditions of the part being held and exert pressure thereon without changing the shape of the part. Additional features include differential pressures and differential wall thicknesses to compensate for differential thicknesses in the work part. Other features include the use of pressure and vacuum to manipulate the pliant wall to assure proper gripping particularly on parts which may have a recessed portion.

3,677,560

CHUCK HAVING MEANS TO AXIALLY POSITION TOOL

Frank Henry Clarkson, Nuneaton, Warwickshire, Guernsey (Channel Islands), assignor to Clarkson International Tools Limited, Nunecton, Warwickshire, England

Filed Nov. 2, 1970, Ser. No. 85,873
Int. Cl. B23b 31/04
U.S. Cl. 279—47 3 Claims



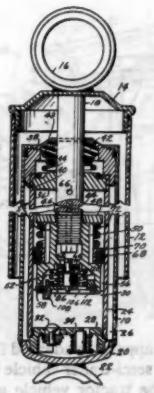
A chuck comprising a body, tool gripping means in the body, a tool locating part slidably mounted in the body to control the axial position of the tool whilst maintaining its concentricity, an adjusting ring engaging the tool locating part and being axially located within the body, the body having a lateral opening for access to the adjusting ring, and means on the adjusting ring accessible through the opening whereby it can be rotated by a suitable tool to control axial position of the tool locating part in the body.

3,677,561

ADJUSTABLE SHOCK ABSORBER ASSEMBLIES

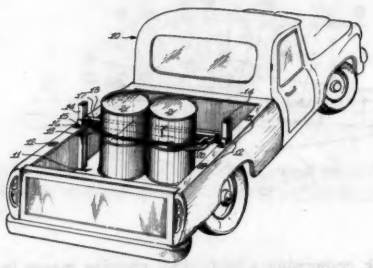
Sellers B. McNally, Homewood, Ill., assignor to Maremont Corporation, Chicago, Ill.

Filed Jan. 5, 1971, Ser. No. 104,117
Int. Cl. B60g 77/04
U.S. Cl. 280—124 F 9 Claims



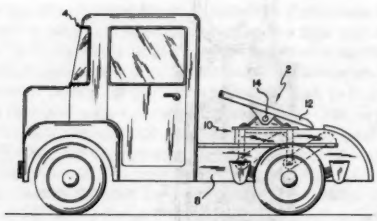
A set of direct, double acting, hydraulic shock absorbers for use in a racing vehicle having front and rear wheels, one pair of shock absorbers being adapted for mounting in the front suspension system and a second pair of shock absorbers for mounting in the rear suspension system; manually adjustable means in the form of a variable flow passage and an adjustable valve are provided for controlling the damping characteristics of each of the shock absorbers of the set so that the shock absorbers may be used on a vehicle under ordinary road conditions and be adjusted to meet the conditions encountered when the vehicle is used in high-speed races.

3,677,562
PICK-UP LOAD HOLDER
Benjamin Bronstein, McLure, British Columbia, Canada
Filed Dec. 14, 1970, Ser. No. 97,642
Claims priority, application Canada, Sept. 1, 1970, 092085
Int. Cl. B60p 7/12
U.S. Cl. 280—179 A 1 Claim



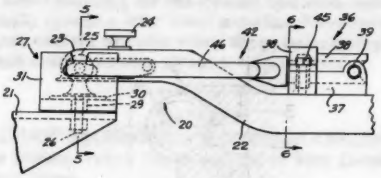
In a load carrying vehicle such as a pick-up truck, a cross-beam spans the load carrying area and is connected at each end thereof to a vertical stake mounted in a stake pocket which is normally part of the vehicle body. The load can be secured against the cross-beam with a load retainer, such as a chain and cinch mechanism, the ends of which are firmly attached to the stakes.

3,677,563
FIFTH WHEEL COUPLER APPARATUS
Ned Bott, 2169 Westview Drive, Ashland, Ohio
Filed July 1, 1969, Ser. No. 838,154
Int. Cl. B62d 53/08
U.S. Cl. 280—425 R 5 Claims



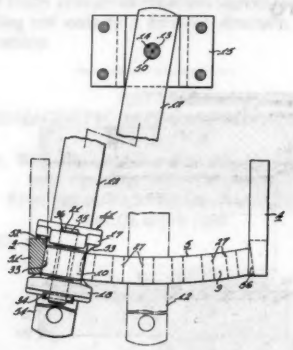
A fifth wheel coupler apparatus adapted for use with a tractor vehicle for hauling a semi-trailer vehicle including a pair of trackways carried by the tractor vehicle and a carriage assembly supported for riding movement on the trackways. A fifth wheel is mounted on the carriage assembly adapted for coupling the trailer vehicle to the front end of the semi-trailer vehicle. The trackways are inclined in a generally upwardly and rearwardly direction with respect to the horizontal or normal direction of movement of the tractor vehicle enabling the carriage assembly, and thus, the front end of the trailer vehicle to be elevated upon relative movement of the tractor vehicle with respect to the semi-trailer vehicle. A locking unit is provided to hold the carriage assembly in the raised position while the semi-trailer vehicle is transported from one location to another.

3,677,564
SAFETY TRAILER HITCH
Gilbert C. Kothmann, P.O. Box 680, Mason, Tex.
Filed March 27, 1970, Ser. No. 23,373
Int. Cl. B60d 1/12
U.S. Cl. 280—457 5 Claims



A safety trailer hitch in which a yoke is secured to the tow bar of the trailer and to the hitch of the towing vehicle to prevent the trailer from becoming disconnected should the socket portion on the trailer become detached from the ball. The yoke may be easily disconnected from the trailer hitch when disconnecting the trailer from the towing vehicle. In a modified form of the invention a finger on the trailer hitch is arranged to be swung into a position overlying the socket to prevent the socket from detaching from the ball. When disconnecting the trailer the finger is swung out of the way to permit the socket to be lifted off of the ball.

3,677,565
SWINGING DRAWBAR
Michael L. Sloslarek, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Oct. 26, 1970, Ser. No. 83,690
Int. Cl. B60d 1/14
U.S. Cl. 280—499 10 Claims

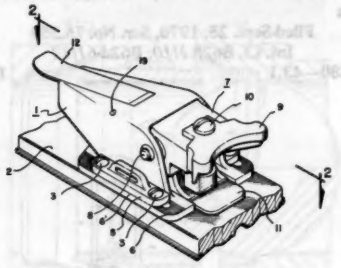


A swinging drawbar and drawbar carriage supported on a bail assembly forming lateral abutments engaging the drawbar and carriage to overcome twisting and distorting moments on the drawbar when lateral movement of the drawbar is arrested at its extreme lateral positions.

3,677,566
SKI-BINDING HEEL MECHANISM
John S. Lawrence, Ogden, Utah, assignor to Browning Arms Company, Morgan, Utah
Filed Oct. 6, 1970, Ser. No. 78,501
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 9 Claims

A ski-binding heel mechanism comprising a movable housing to a main housing to be attached to a ski. The movable

housing is provided with a step plate and also a heel clamp. In particular, the movable housing is provided with a cam roller that reacts against a compound cam surface of a spring-loaded plunger provided in the main housing. Said compound cam surface comprises an upper (hold) face and a lower (release) face. A lever is provided in the main housing which is independent of the movable housing and which operates to effect a



manual release of the ski boot, by pressing down upon a reaction member associated with the movable housing.

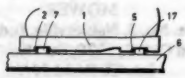
In a preferred form of the invention, the heel clamp is pivoted to the movable housing by a bolt to allow adjustment of the heel clamp for different sized boots. Also, a set screw adjustment is provided to permit adjustment of the release pressure.

3,677,567

LOW FRICTION BEARING ARRANGEMENT FOR SKI BOOT IN CONTACT WITH A SKI

Georges P. J. Salomon, 34 Ave. de Loverchy Annecy, Haute-Savoie, France

Filed Sept. 2, 1969, Ser. No. 854,366
Claims priority, application France, Sept. 6, 1968, 1067-74
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 C 7 Claims



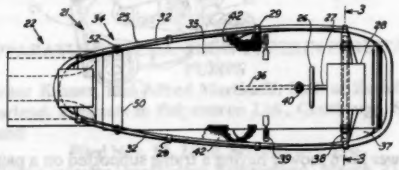
A low friction bearing arrangement for a ski boot contacting a ski comprising at least one slot having a smooth bottom surface extending substantially across the ski boot and at least one corresponding friction plate secured to the ski.

3,677,568

SNOW SLED

Gordon E. Nelson, 51 Blossom Lane, Marlboro, Mass.

Filed Aug. 7, 1970, Ser. No. 62,023
Int. Cl. B62b *13/08*
U.S. Cl. 280—21 R 18 Claims



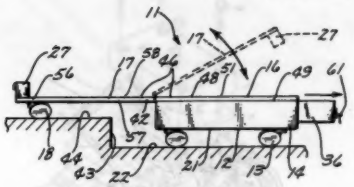
Disclosed is a snow sled which may be controlled in a variety of snow conditions by placement and manipulation of several control surfaces including a rearwardly mounted movable rudder which compresses and directs snow, and laterally mounted auxiliary guides.

3,677,569

FOLDABLE CRAWLER

Howard M. Larson, 1005 13th St., Ames, Iowa

Filed March 9, 1970, Ser. No. 17,410
Int. Cl. B62b *11/00*; B25h *5/00*
U.S. Cl. 280—32.6 7 Claims



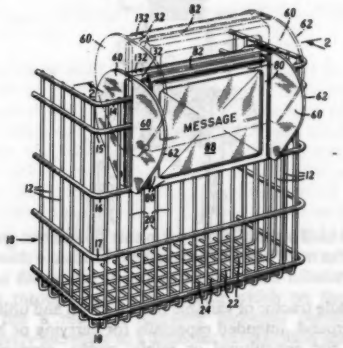
A foldable crawler is provided herein which, in its folded position, has a valise-like configuration. The crawler comprises a bottom side having wheels mounted thereon, sidewalls, and a top side. An extender is hingeably attached at one end to one end of the top side. A wheel is affixed to the top surface of the extender. in its folded position, proximate the other end of the extender. The extender can be rotated 180° and the wheel on the extender can contact a raised surface, such as the floor inside a kitchen cabinet, to provide a substantially flat, rollable working surface.

3,677,570

DISPLAY DEVICE FOR NESTABLE TYPE SHOPPING CART

Jon Hedu, Watertown, Conn., assignor to Actmedia, Inc., Westhampton Beach, N.Y.

Filed April 9, 1971, Ser. No. 132,775
Int. Cl. G09f *3/18*
U.S. Cl. 280—33.99 A 16 Claims



A display device for mounting on the vertical front wall part of a nestable type shopping cart, the display device having a pair of display panels carrying intelligence mounted on opposite faces of said front wall part for vertical sliding travel between a lowered retracted position and an upper extended display position. Biasing means normally maintain the device in extended display position. When a shopping cart is nested into a second like shopping cart, the upwardly swingable rear wall part of the second cart is engaged by camming structure on at least one display panel to swing said rear wall part upwardly and thereby apply downwardly directed force against said display device to vertically slide it to retracted position.

3,677,571
BEACH CART

Thomas F. Maturo, Jr., 2535 S. Lincoln Ave., Vineland, N.J., and Frank Prisinzano, Harding Highway, R.D. #1, Richland, N.J.

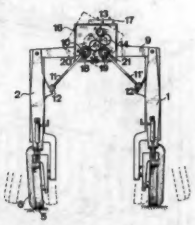
Filed Sept. 9, 1970, Ser. No. 70,673
Int. Cl. B62b 1/00
U.S. Cl. 280—36 R 3 Claims

A collapsible tubular frame attaches a carrying bag for storing articles therein. A roller is connected to the frame to allow transport of the cart through sand. The roller is constructed of annular end plates with a cylindrical mesh screen attached to the end plates. The frame includes extending arms for conveniently supporting a beach chair.

3,677,572
STRADDLE TRACTORS

Andre Fontan, 11, rue Nationale, Nogaro, and Rene Benac, Avenue Saint Roch, Mirande, both of France

Filed Oct. 19, 1970, Ser. No. 81,736
Claims priority, application France, Oct. 20, 1969, 6935875
Int. Cl. B62d 61/12
U.S. Cl. 280—39 5 Claims

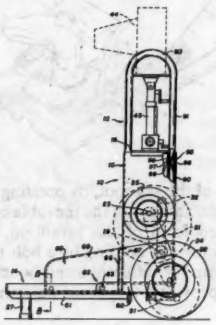


A straddle tractor of variable tractor width and utilizable on sloping ground, intended especially for carrying or hauling a machine for agricultural or public works, comprises four upright members having wheels articulated on their lower extremities and which are rigidly fixed together two by two by cross-members in order to form two rigid lateral flanks coupled to each other by at least one upper arm articulated on the said flanks in such manner that each flank is capable of pivoting with respect to the said arm about a horizontal axis, each of the two lateral flanks being further attached to the upper arm by means of a member of variable length articulated both on the arm and on the flank considered. Each of the members of variable length is constituted by an endless screw engaged in a tubular nut and capable of rotating with respect to the said nut by the action of driving means having two directions of rotation, transmission means fixed to the upper arm and comprising a device for reversing the direction of operation, being provided in order to transmit the movement of rotation to both the two rotating screws and permitting the direction of rotation of one screw to be reversed with respect to the other.

3,677,573
PHOTOGRAPHIC EQUIPMENT CART

Sonny B. Chin, 5750 Charles St., Burnaby, British Columbia, Canada

Filed Sept. 25, 1970, Ser. No. 75,354
Int. Cl. B62b 1/10; B62d 61/12
U.S. Cl. 280—43.1 10 Claims

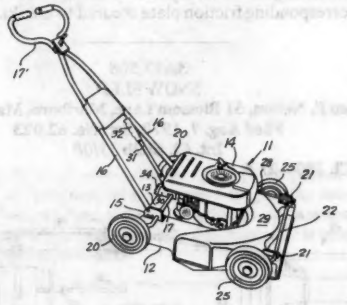


A cart having two sets of wheels which are interchangeable, one set for another, so that the cart can readily be converted from outdoor use to indoor use and vice versa. The cart is capable of transporting equipment such as that used by a photographer and also providing a steady base for the camera mount. Parts of the cart are foldable and others collapsible for convenience in storing the cart in a confined space.

3,677,574
MEANS FOR ADJUSTING HEIGHTS OF CUT IN POWER MOWER

Lawrence Cyr, Rte. No. 3, Noblesville, Ind.

Filed Oct. 9, 1970, Ser. No. 79,421
Int. Cl. B62d 21/18
U.S. Cl. 280—43.13 5 Claims



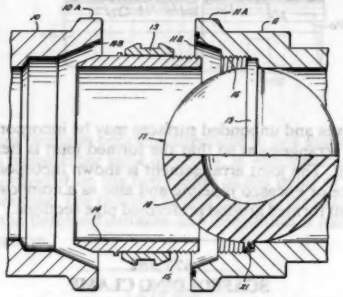
A power lawn mower having a frame supported on a pair of rotatable spaced transverse shafts provided at their ends with crank arms on which supporting wheels are journaled. The shafts are linked together and one of the shafts is provided with a control lever having a dog engagable with a notched sector member on the frame to lock the mower at an adjusted cutting height.

3,677,575

APPARATUS FOR TEMPORARILY CLOSING A PIPELINE

Alfred W. Wedel, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Aug. 3, 1970, Ser. No. 46,491
Int. Cl. F16l 35/00
U.S. Cl. 285—3 10 Claims



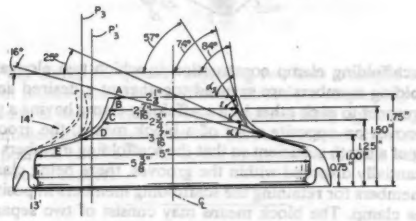
There is disclosed a body having an outer elastic surface of a diameter which fits closely within a pipe, and a shearable flange about the body which is tightly engaged in a groove within the pipe to temporarily retain the body in position to close the pipe.

3,677,576

ROOF FLANGE WITH ELASTOMERIC COLLAR

Craig S. Gustafson, Blueberry Lane, Lincoln, Mass.

Filed Aug. 5, 1970, Ser. No. 61,099
Int. Cl. E04d 13/00
U.S. Cl. 285—43 6 Claims



Roof flanges with elastomeric collars having improved sealing characteristics. With the collar belling gradually from its opening, defining a convex surface engaging the pipe over a substantial distance, a liquid-tight seal results despite variations in the size or surface of the pipe. A pre-applied lubricant on the sealing surface enables attachment of high pressure collars while improving sealing.

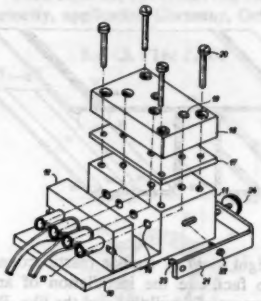
3,677,577

APPARATUS FOR CHANGING TUBES IN PERISTALTIC PUMPS

Werner Krauer, and Alfred Martinelli, both of Zurich, Switzerland, assignors to Polymetron Ltd., Glattbrugg, Switzerland

Filed Nov. 17, 1969, Ser. No. 877,296
Claims priority, application Switzerland, March 21, 1969, 4278/69
Int. Cl. F16l 39/00
U.S. Cl. 285—137 R 9 Claims

An apparatus for changing tubes in peristaltic pumps comprising a coupling member arranged to receive the tubes of the peristaltic pump and a clamping means for pressing the coupling member against a support. The coupling member has a plurality of nipples corresponding to the number of pump tubes and each nipple is surrounded by a sealing ring. The inlet and outlet conduits to the peristaltic pump are inserted in a cover plate which is fixed to the support with a gasket being provided between the plate and the support. The clamping means is in the shape of a stirrup having a tightening screw and a pin on each side of the stirrup for engaging in a notch of the coupling member when the stirrup is moved backwards by means of the tightening screw.

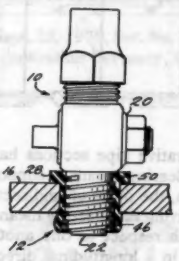


3,677,578

CONNECTION FITTING FOR A PIPE

Robert R. Roos, Decator, Ill., assignor to Mueller Co., Decatur, Ill.

Filed Feb. 19, 1971, Ser. No. 117,024
Int. Cl. F16l 41/04
U.S. Cl. 285—162 9 Claims

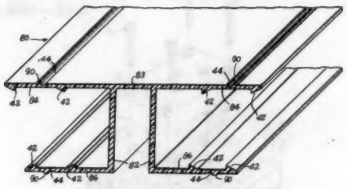


A fitting and sealing sleeve for establishing a fluid tight connection with a main of the type constructed from asbestos-cement; the fitting has an exteriorly threaded tubular member having a through bore, one end of which on the exterior thereof has a reduced diameter threaded portion which progressively increases to a diameter substantially equal to the diameter of the remaining threaded portion of the tubular member; the sealing sleeve is constructed from a resiliently deformable material and has a helical coil partially embedded in its interior wall so that a portion of the coil's edge projects radially inwardly with respect to the longitudinal axis of the sleeve; arcuate ring segments are carried between adjacent turns of the coil at one end of the sleeve; when the sleeve is inserted into an opening in the main and the tubular member threaded down into the sleeve, the exterior surface of the tubular member will expand the sleeve to press it into sealing engagement with the wall of the opening and, when the tubular element is fully inserted into the sleeve, the ring segments will be expanded outwardly to form an external bead on the sleeve to prevent removal of the fitting back through the opening.

3,677,579
CONNECTIONS FOR CONDITIONED AIR DUCTS

Wayne N. La Vanchy, 2303 Ida Drive, Arnold, Mo.

Filed Feb. 20, 1970, Ser. No. 13,085
Int. Cl. F16l 55/00
U.S. Cl. 285—169 4 Claims

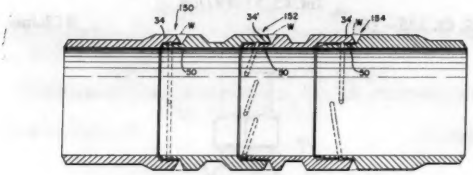


Prefabricated rigid vinyl or similar plastic connector elements adapted to facilitate the installation of an air duct system in the basement of a building and the like. Particularly although not exclusively designed for connections in duct systems of the rectangular rigid board type. The connectors serve to obviate the tedious and time-consuming grooving, shiplap and sealing operations currently required and employed.

3,677,580
ADJUSTABLE PIPE COUPLING

Charles E. Klanke, 1416 Luke Lane, Indianapolis, Ind.

Filed April 7, 1970, Ser. No. 26,303
Int. Cl. F16l 13/04
U.S. Cl. 285—184 6 Claims



A pair of cooperative pipe sections have telescopic male and female ends. Bearing means is supported by the end of one of said sections, the other of said sections having groove means therein receiving said bearing means to enable rotation of the sections with respect to one another but preventing separation thereof in a longitudinal direction. The two sections are provided with cooperative adjacent weld bevels to enable the sections to be rigidly welded to one another.

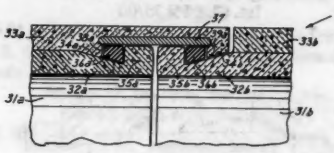
The first form of the invention permits rotation of one section with respect to another through an angle of 360°. A second form of the invention permits extension of one section with respect to another in a longitudinal direction, and a third form of the invention enables one section to be slanted at an angle with respect to the adjacent section. These different forms of the invention may be combined in various combinations.

3,677,581
KEYED JOINT ARRANGEMENT FOR INTERCONNECTING PIPE SECTIONS

Thomas K. Breitfuss, 17541 Orange Tree Lane, Tustin, Calif.

Filed Sept. 30, 1970, Ser. No. 76,855
Int. Cl. F16l 21/02
U.S. Cl. 285—292 12 Claims

Sections of pipe are connected by a keyed joint arrangement. A peripheral groove is formed in the end of one pipe section. An envelope attached to the other pipe section extends longitudinally over the groove. A tongue formed on the envelope mates with the groove to key the pipe sections together in a joint arrangement which limits the longitudinal movement of the pipe sections relative to each other. Gaskets,

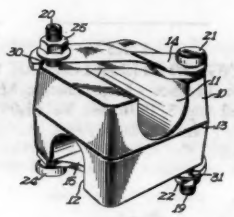


joint sleeves and unbonded surfaces may be incorporated into the joint arrangement so that the formed joint is flexible and watertight. The joint arrangement is shown incorporated in a composite or encased pipeline and also as a composite or encased joint formed around preformed pipe sections.

3,677,582
SCAFFOLDING CLAMP

Kenneth E. Flick, New Brighton, Minn., assignor to Jewel Manufacturing Company

Filed Aug. 5, 1970, Ser. No. 61,101
Int. Cl. F16b 7/04
U.S. Cl. 287—49 4 Claims



A scaffolding clamp construction in which two elongated scaffolding members are secured together at a desired angle with respect to each other by a scaffolding clamp having a pair of grooves on opposite sides of a block means, the grooves being of a depth sufficient so that the scaffolding members are substantially disposed within the grooves, there being clamping members for retaining the scaffolding members in position in the clamp. The block means may consist of two separate blocks which can be angularly adjusted with respect to each other to adjust the angular position of the scaffolding members. In the preferred form, however, the block is a solid block and bolts extend through the block on opposite diagonal corners, the bolts acting both as means for pivotally holding the clamping bars at one end and clamping the bar at its opposite end against the scaffolding member. By reason of the fact that the assemblage of the two clamp bars and the two bolts completely surround the two scaffolding members at the area where they cross each other and that the bars and bolts are of material having a relatively high tensile strength, the material of the block means need not necessarily be of such high tensile strength.

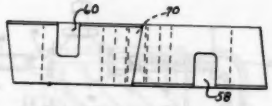
3,677,583
BUSHING AND METHOD OF MANUFACTURING

Fred J. Steinke, South Bend, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed July 30, 1970, Ser. No. 59,481
Int. Cl. F16d 1/06
U.S. Cl. 287—52.06 14 Claims

A method of fabricating tapered bushings for use with hubs having a tapered internal wall corresponding to the external

taper on the bushing, for use with securing screws inserted in holes intersecting the tapered surfaces. The method includes the steps of placing the blanks having the tapered surfaces together and drilling a single hole in the area of contact between the two blanks and tapping the hole while said blanks are in contact with one another. The hole may be drilled with



the bushings facing in opposite directions to one another with the blanks facing in the same direction, in which flattened surfaces are provided on the two blanks at the point of contact with one another. The bushing having the foregoing configuration with the flattened surfaces also constitutes a part of the present concept.

3,677,584

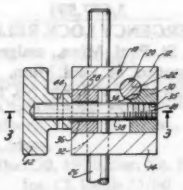
TWO DIRECTION QUICK ADJUSTING BAR CLAMP

Henry O. Short, Lynchburg, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Filed March 24, 1971, Ser. No. 127,567

Int. Cl. F16b 7/04

U.S. Cl. 287—49 **2 Claims**



A bar clamp for quickly adjusting two bars arranged in different planes and in two different directions employing a single control device, operative for simultaneously tightening and simultaneously releasing the two bars to and from the clamp in any position of adjustment of the bars relative to each other in said two directions.

3,677,585

BALL JOINT FOR VEHICLE LINKAGES

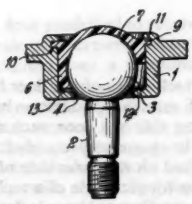
Wolfgang Scheerer, Strump, Germany, assignor to A. Ehrenreich & Cie

Filed Sept. 22, 1970, Ser. No. 74,414

Claims priority, application Germany, Oct. 23, 1969, P 19 53 396.1

Int. Cl. F16c 11/06

U.S. Cl. 287—87 **3 Claims**



A ball and socket joint wherein the bearing member positioned between the ball element and the joint housing is formed as an integral, unitary member with the housing cover.

3,677,586

BALL JOINT WITH COVER PLATE FOR VEHICLES LINKAGES

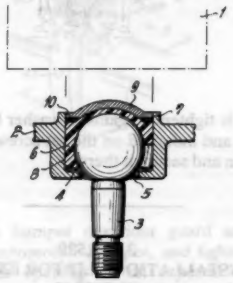
Klaus Stuck, Buderich, Germany, assignor to A. Ehrenreich & Cie

Filed Sept. 22, 1970, Ser. No. 74,415

Claims priority, application Germany, Oct. 22, 1969, P 19 53 115.8

Int. Cl. F16c 11/06

U.S. Cl. 287—87 **2 Claims**



A ball and socket joint having a cylindrical bore in the joint housing, a bearing element in the bore surrounding the ball member and a cover having a peripheral edge coextensive with the end of the housing and electron beam welded thereto.

3,677,587

BALL JOINT FOR VEHICLE LINKAGES

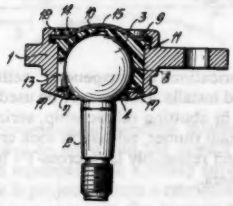
Andreas Schmidt, Osterath-Bovert, and Paul Muller, Dusseldorf-Oberkassel, both of Germany, assignors to A. Ehrenreich & Cie

Filed Sept. 22, 1970, Ser. No. 74,444

Claims priority, application Germany, Oct. 22, 1969, P 19 53 116.9

Int. Cl. F16c 11/06

U.S. Cl. 287—87 **7 Claims**



A ball and socket joint including a bearing member in the joint housing, the bearing having a plurality of small protrusions on one end thereof. The protrusions may be flattened during assembly to compensate for tolerances in production.

3,677,588

FASTENER

George C. Coffield, Jr., Pleasant Valley, Iowa, assignor to The United States of America as represented by the Secretary of the Army

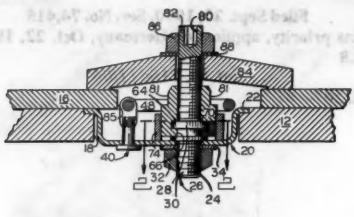
Filed Dec. 1, 1970, Ser. No. 93,936

Int. Cl. F16b 5/02, 35/00

U.S. Cl. 287—189.36F **5 Claims**

A fastener assembly is fixedly attached to a stud recessed in a partition and includes a set screw attached by an adaptor to

the stud for axial extension therefrom through a hole in the item to be fastened. A nut engaged with the extending end of



the set screw is tightened against a washer larger in diameter than the hole and mounted on the set screw to draw the item to the partition and secure it thereto.

3,677,589

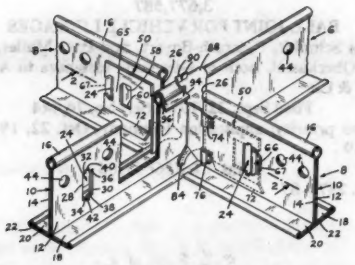
FIELD INSTALLATION CLIP FOR EXPOSED GRID SYSTEMS

David Jack Roles, Baltimore, Md., assignor to Eastern Products Corporation, Columbia, Md.

Filed Feb. 18, 1971, Ser. No. 116,520

Int. Cl. E04c 2/42

U.S. Cl. 287—189.36A **6 Claims**



In the fabrication of suspended ceiling exposed grid systems, a field installation clip may be used to releasably lock main runners in abutting relationship, serially connect cross-T's across a main runner, releasably lock cross-T's in abutting relationship and releasably lock cross-T's in parallel between two main runners.

3,677,590

FLUIDIZED SAND TRAP EJECTOR

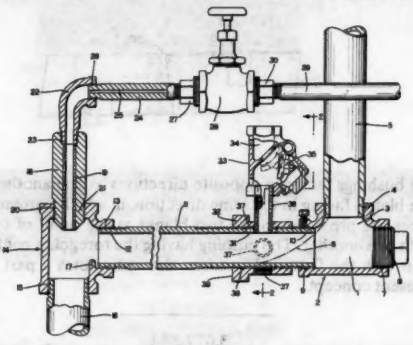
Waldama Bente, 314 Miller Ave., Dennison, Ohio

Filed Dec. 16, 1970, Ser. No. 98,636

Int. Cl. B60b 39/08; B61c 15/10; B65g 53/54

U.S. Cl. 291—3 **7 Claims**

An ejector for a sand trap for sanding track rails by eduction. A sand chamber has an inlet through which sand may be continuously fed as by gravity, and an outlet connected by a tubular casing to the upper end of a sand delivery pipe to the track rail. The exterior of the tubular casing is threaded and there is a longitudinally disposed elongated opening therein. A sand metering device, in the form of a sleeve with a plurality of tapped apertures therein, is threaded upon the tubular casing. A check valve has a threaded neck selectively threaded into one of said tapped apertures and inserted into said elongated



opening. A nozzle connected to an air pressure supply is located above the upper end of the sand delivery pipe.

3,677,591

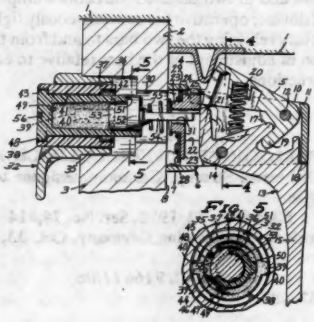
EMERGENCY LOCK RELEASE

Russell W. Waldo, St. Paul, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.

Filed Dec. 23, 1970, Ser. No. 100,855

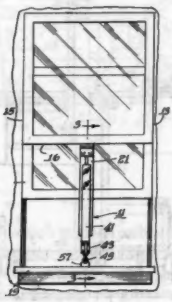
Int. Cl. E05c 3/16

U.S. Cl. 292—221 **3 Claims**



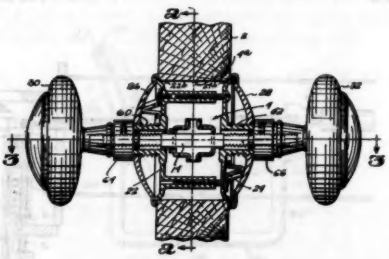
An emergency lock release for a door having a fixed outer handle and a latch releasing pushbutton mounted in the fixed handle on the outer side of a door, such as a bathroom door. The pushbutton is operatively coupled to a latch locking mechanism mounted on the inner side of a door and is provided with a recess for reception of a tool by means of which the pushbutton may be rotated to unlock the latch mechanism from the opposite or outer side of the door, when a person at the inner side becomes incapacitated or cannot otherwise unlock the door from the inner side thereof.

3,677,592
WINDOW BRACE
Joseph Navara, 2105 West Walton, Chicago, Ill.
Filed Aug. 24, 1970, Ser. No. 66,334
Int. Cl. E05c *19/18*
U.S. Cl. 292—288 4 Claims



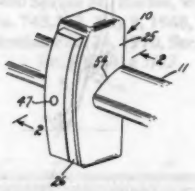
An adjustable window brace for positioning balanced and storm windows at a selected position.

3,677,593
DOOR HARDWARE MECHANISM INCLUDING DECORATIVE DOOR KNOBS AND DOOR BACK PLATES
Edward John Wahlberg, Hanover, Mass., assignor to Dekhar, Inc., Watertown, Mass.
Filed Dec. 30, 1970, Ser. No. 102,643
Int. Cl. E05b *15/00*
U.S. Cl. 292—356 2 Claims



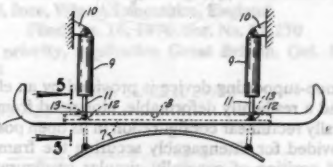
A lock set for a door predrilled to receive a cylindrical type lock includes a pair of apertured centering plate members which can be mounted over a threaded lock spindle and secured to one another at opposite sides of a predrilled door opening in correctly centered positions. The centering plate members when thus secured together present tubular door knob holder portions constituting a solid anchoring base operable to hold rotatable door knobs and spindle portions in coaxial relationship with the drilled hole and in suitably spaced relation to adjacent door surfaces. Back plates are adjustably supported externally of the door knob holder portions without fastenings to constitute a quality door hardware assembly which can be very quickly and cheaply installed.

3,677,594
BUMPER GUARD MOUNTING ASSEMBLY
Seymour I. Gussack, New Rochelle, and Hugh Berry, Scarsdale, both of N.Y., assignors to X-L-O Automotive Accessories, Inc., West Nyack, N.Y.
Filed Nov. 12, 1970, Ser. No. 88,794
Int. Cl. B60r *19/04, 19/08;* B61f *19/04*
U.S. Cl. 293—67 2 Claims



An automotive bumper overrider guard adapted to be pushed onto an automotive bumper, and tightened in place through an access opening on an exposed outer surface thereof, the access opening being subsequently closed by a protective and/or decorative cap.

3,677,595
AUTOMOBILE BUMPER
Douglas L. P. Hamilton, 8110 N. Beach Drive, Milwaukee, Wis.
Filed June 30, 1970, Ser. No. 51,176
Int. Cl. B60r *19/04*
U.S. Cl. 293—73 4 Claims



The modern ornamental automobile bumper which is notoriously ineffective to withstand the impact of even a low speed collision is equipped with a sturdy spring steel impact receiving bar that is projected from a retracted position unobstrusively seated in a recess in the bumper to an operative position outwardly of the bumper as a consequence of the sudden forceful depression of the brake pedal by a driver attempting to avoid a collision.

3,677,596
CADDY FOR DISPOSABLE PLASTIC BAGS
Rosemary C. Yonaites, and Gary A. Yonaites, both of 1529 Greenleaf Street, Evanston, Ill.
Filed July 14, 1970, Ser. No. 54,689
Int. Cl. A47f *13/08*
U.S. Cl. 294—19 5 Claims

A caddy for disposable plastic bags which supports the bag with the mouth open to receive trash to be swept therein. The bag is clamped on a wire frame by a moveable open frame having a U-shaped groove in which the wire frame is seated. A

wedge shaped lip is pivotally mounted on the lower end of the caddy and is spring urged downwardly. The lip is engaged

against the surface and the caddy is pressed downwardly to hold the lip tightly against the surface while it serves as a ramp for the sweeping when filling the bag.

3,677,597

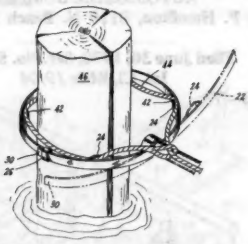
LOOP-SUPPORTING DEVICE

Harold A. Stipek, 160 Victoria Road, New Britain, Conn.

Filed March 30, 1971, Ser. No. 129,522

Int. Cl. B63b *21/04*

U.S. Cl. 294—19 R **7 Claims**



A loop-supporting device is provided by an elongated handle and a resiliently deformable, elongated frame member of generally rectilinear configuration in its open position. A clasp is provided for disengagably securing the frame member in closed position of generally circular configuration, and the frame member has a plurality of line support elements spaced along the length thereof. With the frame member in its closed position, the loop of a line may be supported thereby, after which the loop and frame member may be positioned about a piling, as in a boat mooring operation. Drawing the frame member against the piling releases the engagement by the clasp and allows the frame member to return to its open, generally rectilinear position. This, in turn, permits release of the line and removal of the device with the loop remaining about the piling.

3,677,598

SYPHON LIFTING DEVICE HAVING PISTON ACTUATED VENTING VALVE

Klaus Becker, Volmarstein/Ruhr, Germany, assignor to Demay Aktiengesellschaft, Duisburg, Germany

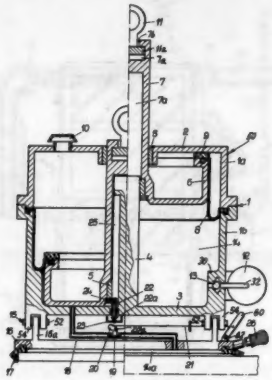
Filed April 21, 1970, Ser. No. 30,547

Claims priority, application Germany, May 13, 1969, P 19 24 293.4

Int. Cl. B66c *1/02*

U.S. Cl. 294—64 R **9 Claims**

A syphon for lifting solid articles includes a piston which is guided within a cylinder on a centrally arranged upstanding guide member and it is connected to a rod portion having means for connecting the device to a hoisting unit. A rolling diaphragm is connected from the upper end of the piston to an intermediate annular wall portion of the cylinder so that upward movement of the piston creates a vacuum in the space therebelow which is communicated through a conduit to a



sealing area defined below a suction plate. The plate may be guided into association with an article to be lifted by a handle and the interior of the cylinder may be vented by a hand operated valve control which will open the lower portion of the cylinder to the atmosphere only when the piston has been lowered so as to permit actuation of the valve control.

3,677,599

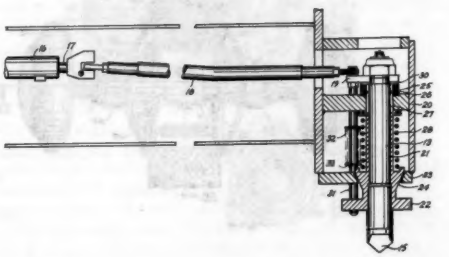
SELF ALIGNING LATCHING MECHANISM ON A CARGO CONTAINER SPREADER

James William Shannon, Doubleview, Australia, assignor to Vickers Haskins Pty. Limited,, Railway Parade, Ashfield, Western Australia, Australia

Filed Nov. 6, 1970, Ser. No. 87,540

Int. Cl. B66c *1/42*

U.S. Cl. 294—67 DA **1 Claim**

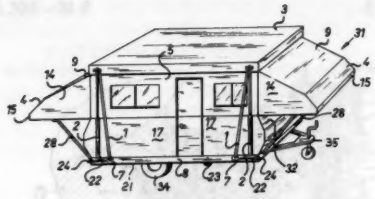


A self aligning latching mechanism on a cargo container spreader, the mechanism mounted so as to surround a post of the spreader and including biasing means to normally keep the post substantially vertical whilst allowing the post limited movement upwardly against the action of the biasing means to a position where its longitudinal axis can be displaced to a slight angle to the vertical. The mechanism serves to allow the spreader to be connected to a container which has one or more of its recesses out of alignment.

3,677,600
CAMPER TRAILER

Jean Charron, 137 Morel St., Repentigny, Quebec, Canada

Filed Feb. 22, 1971, Ser. No. 117,282
Int. Cl. B60p 3/32
U.S. Cl. 296—27 11 Claims

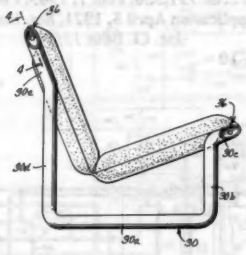


A camper trailer which is collapsible and entirely made of rigid panels. The camper trailer comprises an open top box-like body, a main roof, means to raise the main roof, longitudinal wall panels hinged to the longitudinal sides of said body and, when erected, closing the space between the main roof and the said longitudinal body sides. Extensible parts, entirely made of rigid panels hinged one to the other, can be moved out to protrude from the body and main roof. Each extensible part comprises a horizontal platform mounted on slides, a roof made of panels hinged to the outer end of the platform and to the underside of the main roof and movable in slides under said main roof and of longitudinal panels hinged to the sides of the platform and capable of taking an upright position engaging the roof of the extensible part. The main roof is raised by a system of bars actuated by a winch and cable arrangement.

3,677,601
SLUNG FURNITURE

Andrew Ivar Morrison, Brooklyn, and Bruce R. Hannah, Staten Island, both of N.Y., assignors to Knoll International, Inc., New York, N.Y.

Filed June 8, 1970, Ser. No. 44,200
Int. Cl. A47c 7/02, 7/14, 4/02
U.S. Cl. 297—441 8 Claims



An article of furniture such as a chair formed from two identical side pieces joined together by identical front and rear stretchers. A fabric or other support surface is slung between the front and rear stretchers through the use of a channel in each stretcher defined by an interior portion of the stretcher and an access opening thereto through the stretcher wall. The front and rear edges of the support structure are positioned within the channels in the stretchers. An upholstered cushion structure may be slung in this fashion, with a cushion being formed from top and bottom sheets of fabric material sewn together along two sides thereof to form an open-ended bag, which is then filled with resilient material. An enlargement, such as a cord, is attached to each end of each fabric piece at each open end of the bag, to provide a total of four enlargements, two at each end of the bag. The open ends of the bags are secured to the two stretchers by positioning the two enlargements at each open bag end within the corresponding stretcher channel, thereby holding the cushion and closing the ends of the bag.

3,677,602
TUNNELING MACHINE WITH CONCRETE WALL FORMING MECHANISM

John R. Tabor, 3400 Spruce St., Racine, Wis.

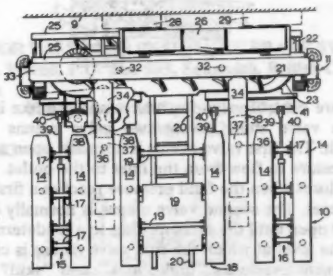
Division of Ser. No. 743,363, July 9, 1968, Pat. No. 3,561,223.
This application Feb. 24, 1970, Ser. No. 17,004
Int. Cl. E01g 3/03
U.S. Cl. 299—31 5 Claims

A tunneling machine having a shield with a spoil excavator at its head end, a truss trailing said shield, a wheeled support for the truss and comprising cradle supports which rest on the tunnel floor and upon which the truss is rollably supported, a thrust connection between the truss and the shield whereby the truss will be drawn forwardly with the shield as the shield is advanced and means for shifting the cradle supports longitudinally along the truss to periodically advance the cradle supports along the tunnel floor.

3,677,603
MINE ROOF SUPPORTS

Fred Small, Ormskirk, England, assignor to Gullick Dobson Limited, Ince, Wigan, Lancashire, England

Filed Oct. 16, 1970, Ser. No. 81,270
Claims priority, application Great Britain, Oct. 16, 1969, 50,856/69
Int. Cl. E21c 29/02
U.S. Cl. 299—31 2 Claims

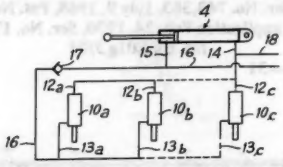


A mine roof support comprises two assemblies one in front of another. The forward assembly carries a mined-material conveyor means, staker means, and a guide or support carrying a mineral winning machine such as a rotary shearer. The rearward assembly serves to support the roof. The support as a whole can be installed in a mine road way or in the stable and can advance itself to extend the roadway or to form a new stable.

3,677,604
HYDRAULIC CONTROL FOR HYDRAULIC BUCKET HAVING RECIPROCATING TEETH

Pierre J. Leyrat, Trilport, France, assignor to Societe Anonyme Poclain, Le Plessis-Belleville, France

Filed Sept. 23, 1970, Ser. No. 74,568
Claims priority, application France, Sept. 29, 1969, 6933171
Int. Cl. E02f 3/81
U.S. Cl. 299—67 4 Claims

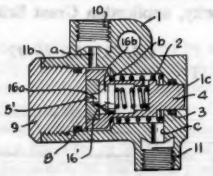


This invention relates to a device for the hydraulic control of a bucket in public works machines provided with at least one movable tooth coupled to a hydraulic hammer, comprising at least one double-action hydraulic jack coupled between the bucket and the structural element on which said bucket is mounted to oscillate, wherein the feed conduits and the delivery conduits of the jack and hydraulic hammers coupled respectively to the bucket and to each of the movable teeth are respectively connected in parallel.

3,677,605
PRESSURE CONTROL VALVE FOR BRAKES AND THE LIKE

Shigeru Matsumoto, and Toshiaki Gotoh, both of Sakado-machi, Irumagun, Japan, assignors to Nippon Oil Seal Industry Co., Ltd., Tokyo-to, Japan

Filed Jan. 8, 1970, Ser. No. 1,341
Int. Cl. B60t 8/26, 11/34
U.S. Cl. 303—6 C 2 Claims



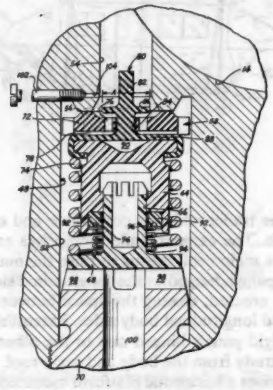
Pressure control valve for brakes and the like including a movable valve stem having two valve means associated therewith. The first valve means is normally open and permits fluid pressure to flow from the inlet to the outlet. This valve means closes when the fluid pressure reaches a first predetermined level. The second valve means is normally closed and does not open until the pressure rises to a predetermined level above the level at which the first valve means is closed. This arrangement precludes "brake lock" and "skid" or "spin" while insuring that a vehicle will stop within a given distance.

3,677,606
METERING VALVE

Paul B. Shutt, St. Joseph, Mich., assignor to The Bendix Corporation

Filed Aug. 5, 1970, Ser. No. 62,237
Int. Cl. B60t 8/26
U.S. Cl. 303—6 C 7 Claims

A metering valve is provided that is installed in the outlet passage of a master cylinder. The outlet passage has a smaller diameter inlet chamber and a larger diameter outlet chamber with a shoulder therebetween. Valve means located in the outlet passage include a first valve member normally urged into engagement with the shoulder and a second valve member is normally urged away from the first valve member to permit fluid communication through the passage. When the pressure

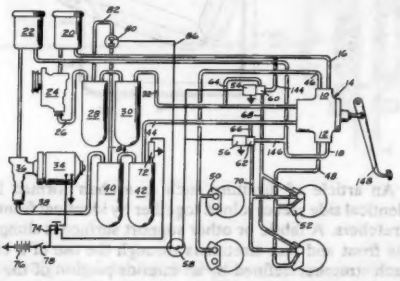


in the passage reaches a first predetermined level, the second valve member is driven into sealing engagement with the first valve member to prevent fluid communication through the passage. The first valve member is driven away from the shoulder to resume fluid communication through the passage when the pressure in the inlet chamber reaches a second predetermined level higher than said first predetermined level.

3,677,607
HYDRAULIC POWER BRAKE SYSTEM

Harold B. Schultz; Keith H. Fulmer, and Richard T. Burnett, all of 401 North Bendix Drive, South Bend, Ind.

Division of Ser. No. 797,530, Feb. 7, 1969, Pat. No. 3,599,761.
This application April 5, 1971, Ser. No. 131,200
Int. Cl. B60t 13/14
U.S. Cl. 303—10 14 Claims



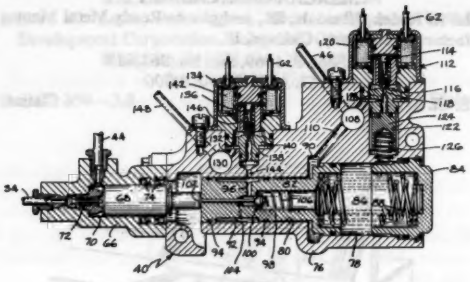
This invention relates to a hydraulic power brake means having two separate sources for hydraulic pressure controlled by a valve to provide separate pressures to a vehicle's front and rear brakes that also is able to regulate a mechanical brake applicator for at least one of the front or rear brakes.

3,677,608

ADAPTIVE BRAKING SYSTEM WITH HYDRAULICALLY POWERED MODULATOR

Richard L. Lewis, South Bend, Ind., assignor to The Bendix Corporation

Filed June 1, 1970, Ser. No. 42,398
Int. Cl. B60t 8/02
U.S. Cl. 303—21 F 1 Claim



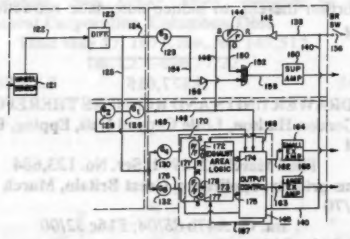
An adaptive braking system for a motor vehicle including a hydraulically actuated brake pressure modulator controlled by solenoid valves which are responsive to signals from wheel deceleration sensors transmitted through a computer. The power piston of the modulator is prevented from separating from the modulating piston by passing the control fluid through a valve positioned in the power piston and held open by contact with the modulating piston.

3,677,609

ADAPTIVE CONTROL FOR FLUID PRESSURE BRAKING SYSTEM

Dennis J. Davis; Dennis J. Sudnick; John E. Juhasz, and Sham Kurichh, all of Elyria, Ohio, assignors to The Bendix Corporation

Filed Sept. 25, 1970, Ser. No. 75,314
Int. Cl. B60t 8/12
U.S. Cl. 303—21 BE 14 Claims



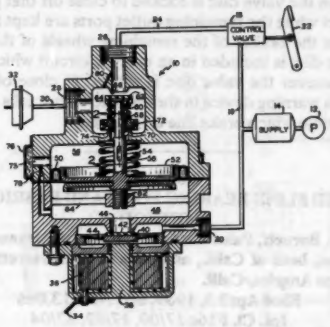
An adaptive fluid pressure braking system responsive to wheel deceleration and acceleration for cyclicly decreasing and increasing braking effort at optimum levels to prevent wheel lock-up and provide maximum deceleration. The system includes band control apparatus responsive to a pair of pre-selected wheel acceleration levels whereby, instead of taking corrective action as soon as sensed, whenever wheel acceleration during a preceding cycle is less than the lower level or greater than the upper level, a signal is generated whereby corrective action is taken during the next cycle. Where maximum wheel acceleration falls between the pre-selected levels no corrective action signal is generated for the next cycle. The corrective action may comprise a greater rate of decrease in braking pressure during the next cycle or a lesser rate of decrease in pressure.

3,677,610

ADAPTIVE BRAKING CONTROL VALVE

Edward M. Pauwels, and James K. Roberts, both of South Bend, Ind., assignors to The Bendix Corporation

Filed Nov. 16, 1970, Ser. No. 89,971
Int. Cl. B60t 17/18
U.S. Cl. 303—21 F 10 Claims



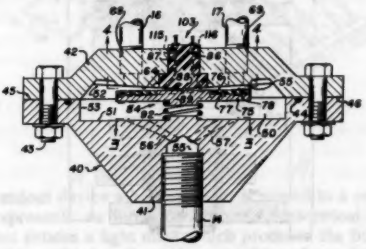
A control valve for use in an adaptive braking system to modulate the pressure delivered to a braked wheel when a skid condition is sensed. The adaptive braking control valve will permit normal unobstructed flow of pressure from the driver's control valve to and from the wheel brake actuating device. Upon sensing an imminent skid condition by the adaptive braking system, a solenoid will be energized that allows a source of pressurized fluid to enter the control valve. The source of pressurized fluid in the control valve will move a diaphragm which closes the pressure received from the driver's control valve and, subsequently, reduces the pressure in the wheel brake actuating device. When an imminent skid condition no longer exists, the solenoid will de-energize thereby terminating the source of pressurized fluid from the control valve. The pressurized fluid acting against the diaphragm is decayed by a bleed orifice, thereby restoring normal communication between the driver's control valve and the wheel-brake actuating device. A small bypass is included to allow a slow pressure build rate in the wheel brake actuating device during the time interval between the stopping of normal communication and the reduction of pressure from the wheel brake actuating device.

3,677,611

ISOLATOR VALVE FOR PNEUMATIC BRAKE SYSTEMS

Joseph A. Vriend, P.O. Box 505, Squamish, British Columbia, Canada

Filed July 23, 1970, Ser. No. 57,437
Int. Cl. B60t 17/22
U.S. Cl. 303—84 A 7 Claims



A valve having a disc mounted in a valve chamber for limited rocking movement in any direction about a centrally

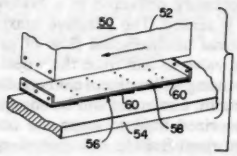
disposed pivot. The valve chamber has outlet ports connected by lines to the brakes of a vehicle and arranged in a circle within the circumference of the valve disc and also an inlet port opposite the outlet ports. The valve disc is supported in a normally open and balanced position when air pressure at the outlet ports is substantially equal but, when a predetermined drop in pressure is sensed at one of the outlet ports, as would occur if the brake line connected to that outlet port was ruptured, then the valve disc is rocked to close off that particular outlet port while the remaining outlet ports are kept fully open to operate the brakes of the remaining wheels of the vehicle. The valve disc is included in an electric circuit which is energized whenever the valve disc is rocked to close off an inlet port and a warning device in the electric circuit tells the driver of the vehicle which brake line is ruptured.

3,677,612

COATED FLUID BEARING FOILS AND FABRICATING METHOD

Morris A. Barnett, Palos Verdes Estates, and Alexander Silver, Tarzana, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed April 3, 1969, Ser. No. 813,066
Int. Cl. F16c *17/00, 17/02, 17/04*
U.S. Cl. 308—5 **6 Claims**



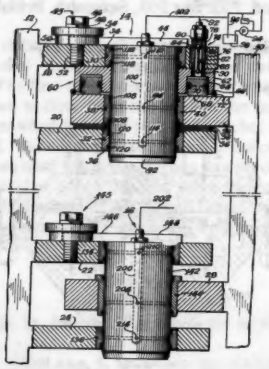
A method of providing an improved fluid foil bearing by coating the foil segments with a solid lubricant. Coated foils for both journal and thrust bearings are also disclosed.

3,677,613

SELF ALIGNING AND SELF ADJUSTING THRUST BUSHING ASSEMBLY

Kenneth E. Houtz, Streamwood, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed May 21, 1971, Ser. No. 145,674
Int. Cl. F16c *17/10*
U.S. Cl. 308—135 **12 Claims**



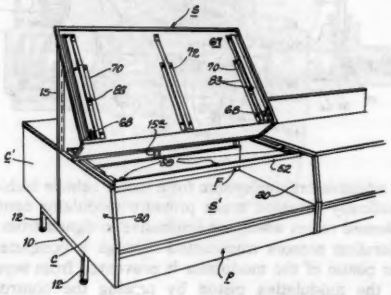
A self aligning and self adjusting thrust bushing assembly for pivotally connecting a pair of frame sections, such as those on an articulated tractor, including a clevis and a hinge plate with a hinge pin extending through the clevis and plate to define a pivot axis. An annular cylinder and piston assembly surrounds the pin and is connected with a source of hydraulic fluid pressure. A check valve permits flow of fluid only into the cylinder.

3,677,614

MERCHANDISE CABINET

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.

Filed Sept. 8, 1969, Ser. No. 862,613
Int. Cl. A47b *87/00, 88/00*
U.S. Cl. 312—108 **6 Claims**



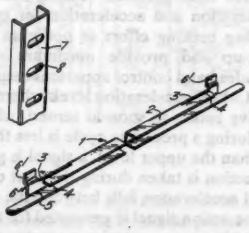
A knockdown merchandise display cabinet primarily designed for retail stores, with a primary objective of simplicity in construction and ready assembly, formed mainly of sheet metal and standard skeleton metal framework, the various parts being relatively flat to permit packing and shipping in compact, shallow packages. Roll-out shelving or drawers are supported on a horizontal frame, with anti-friction means therebetween, to permit sliding action with minimum effort. The shelf-supporting frame in turn is detachably carried by cantilever supports detachably mounted on the skeleton framework for vertically selective attachment. The shelf supporting frame has raceways for bearings under the shelves, which raceways incline downwardly and rearwardly in the back portion thereof, to induce automatic retraction of the shelving.

3,677,615

DRAWER UNITS AND RUNNERS THEREFOR

Leslie Gordon Hudson, Little Copped Hall, Epping, Essex, England

Filed March 12, 1971, Ser. No. 123,684
Claims priority, application Great Britain, March 16, 1970, 12,571/70
Int. Cl. A47b *88/04;* **F16c** *32/00*
U.S. Cl. 312—346 **5 Claims**



The invention relates to a runner which is removably mounted in a support unit for sliding drawers, the runner in-

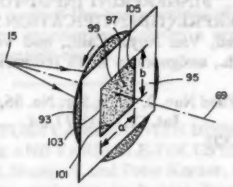
cluding integrally cranked arm portions which engage in slots in uprights of the support unit and locking tongues which are adjustable when the runner is in position to provide against unintentional removal of the runner from the uprights.

3,677,616

REDUCED NOISE HIGH RESOLUTION HOLOGRAPHIC IMAGING USING SPATIALLY INCOHERENT RECONSTRUCTING RADIATION

Robert W. Lewis, Ann Arbor, Mich., assignor to Battelle Development Corporation, Columbus, Ohio

Filed May 3, 1971, Ser. No. 139,341
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **4 Claims**



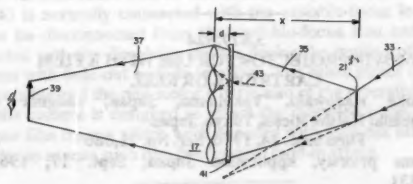
An improved technique for coherent illumination and imaging of non-diffuse objects, including non-diffuse transparencies, wherein a periodic intensity variation across the illuminating beam at the object is substantially eliminated by integrating the pattern over some distance during the viewing or recordation of an object image. A spatially incoherent source having a size related to the period of the intensity distribution is disclosed to accomplish this integration in both direct imaging of an object and holographic reconstruction thereof.

3,677,617

TECHNIQUES OF HOLOGRAPHIC DATA REDUCTION UTILIZING AN ADDITIONAL DIFFUSING STRUCTURE DURING RECONSTRUCTION

Juris Upatnieks, Ann Arbor, Mich., assignor to Battelle Development Corporation, Columbus, Ohio

Filed May 27, 1971, Ser. No. 147,517
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **5 Claims**



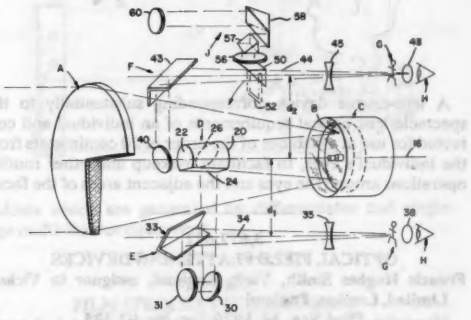
An off-axis optical hologram is constructed of an object with an object modified light being passed through an array of small lenses or some other light modulator. Upon reconstruction of the hologram, a diffracted wavefront is passed back through the array of small lenses or other light modulator. Additionally, during reconstruction, a separate light diffusing element is placed in the path of the diffracted image-carrying beam prior to its striking the light modulator.

3,677,618

BINOCULARS HAVING STABILIZING REFLECTORS

Arnold J. Schwemin, Oakland, Calif., assignor to Optical Research and Development Corporation, Oakland, Calif.

Filed Sept. 28, 1970, Ser. No. 75,906
Int. Cl. G02b *23/00*
U.S. Cl. 350—16 **3 Claims**



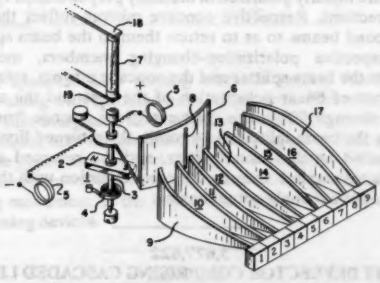
An optical instrument is disclosed having a single light input, paired variable ocular outputs and a folded and split light path therebetween. Provision is made in the folding of the light path for the insertion of a stabilizing mirror to remove apparent image vibration due to ambient instrument vibration.

3,677,619

READOUT DEVICES WITH LIGHT CONDUCTING CHANNELS

Elbert K. Mackenzie, North Wales, Pa., assignor to Electro-Mechanical Instrument Company, Inc., Perkasie, Pa.

Filed April 20, 1970, Ser. No. 30,034
Int. Cl. G02b *27/02*
U.S. Cl. 350—110 **13 Claims**



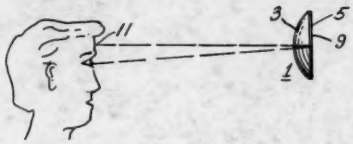
In a readout device a beam of light is moved to a position which represents an input condition. An electrical meter movement rotates a light mask which produces the beam of light. Light-conducting channels are positioned to selectively receive the beam of light. Output means at the other end of the light channels digitally indicate the input condition by the selective illumination from said beam of light.

3,677,620

CORRECTIVE MIRROR ASSEMBLY

Joseph Bettencourt, Albany, Calif., assignor to John D. Pleich, Albany and Paul Holland, Berkeley, Calif., part interest to each

Filed Nov. 20, 1967, Ser. No. 684,208
Int. Cl. G02b 27/02, 17/00, 7/18
U.S. Cl. 350—145 1 Claim



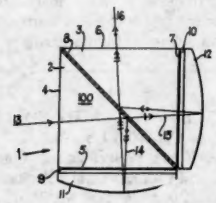
A lens-mirror device corresponding substantially to the spectacle lens optical requirements of an individual and corrected for use at a distance of the order of 20 centimeters from the individual's eyes, to facilitate makeup and other routine operations around the eyes and the adjacent areas of the face.

3,677,621

OPTICAL FIELD FLATTENING DEVICES

Francis Hughes Smith, York, England, assignor to Vickers Limited, London, England

Filed Nov. 24, 1970, Ser. No. 92,395
Claims priority, application Great Britain, Nov. 24, 1969, 57,463/69
Int. Cl. G02b 27/28
U.S. Cl. 350—157 15 Claims



An optical device, for imposing a preselected degree of curvature upon an optical field associated with an image-bearing incident light beam, employs a light-polarizing beam splitter for splitting the incident light beam into a transmitted first beam and a reflected second beam, which first and second beams are linearly polarized in mutually perpendicular respective directions. Respective concave mirrors reflect the first and second beams so as to return them to the beam splitter, but respective polarization-changing members, mounted between the beam splitter and the concave mirrors, rotate the directions of linear polarization of the first and the second beams through 90° in the course of their passage from and back to the beam splitter. As a result, the returned first beam is reflected by the beam splitter, and the returned second beam is transmitted thereby for recombination with the first beam to form a single output beam.

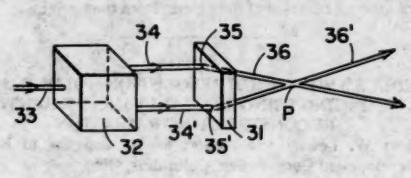
3,677,622

LIGHT DEFLECTOR COMPRISING CASCADED LIGHT DISPLACEMENT MEANS AND HOLOGRAM PLATE

Nobuo Nishida, and Mitsuhito Sakaguchi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sept. 18, 1970, Ser. No. 73,457
Claims priority, application Japan, Sept. 25, 1969, 44/75806
Int. Cl. G02b 27/00
U.S. Cl. 350—163 3 Claims

A deflector for deflecting an incident coherent light beam in a desired direction includes a recording plate in which an interference fringe pattern is recorded. A light beam displacement device is disposed in front of the recording plate to displace a coherent beam incident thereon to a desired path parallel to and displaced from the incident beam.

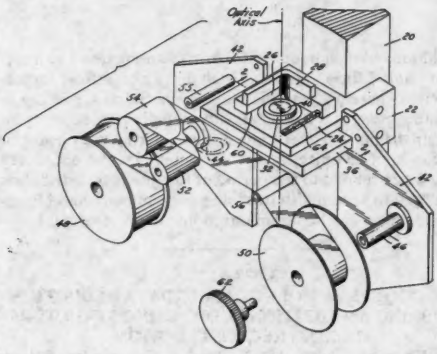


3,677,623

CLEAN WINDOW ASSEMBLY FOR REAL TIME FINGERPRINT INPUT TO FINGERPRINTIDENTIFICATION SYSTEM

William D. Hall, Van Nuys, Calif., and Vernon J. Burzan, Dexter, Mich., assignors to KMS Industries, Inc., Ann Arbor, Mich.

Filed Nov. 2, 1970, Ser. No. 86,087
Int. Cl. G01b 11/24
U.S. Cl. 350—321 4 Claims



An assembly for the introduction of fingerprint data in an identification system including an input surface to lie on an optical axis and a strip of light transmitting film carried on suitable wind-out and wind-in reels to provide a fresh surface when moved incrementally across the input surface. Assembly also may be moved in limited rotation for alignment.

3,677,624

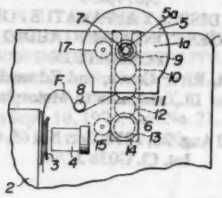
MOVIE PROJECTOR FOR USE WITH A FILM CARTRIDGE OR REEL

Tatsusuke Kadowaki, Yokohama, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Sept. 14, 1970, Ser. No. 71,860
Claims priority, application Japan, Sept. 17, 1969, 44/74231
Int. Cl. G03b 23/02
U.S. Cl. 352—73 7 Claims

An 8mm movie projector is operable selectively with either a film cartridge or an open reel, and includes a reel support arm provided in the upper part of the projector housing for vertical displacement into and out of the projector. The reel support arm has a spindle projecting laterally therefrom adjacent its upper edge, for fitting of a film reel over the spindle. When the reel support arm is in an upper position in which it projects from the projector, an open reel can be used with the

projector. When the reel support arm is retracted to a lower position within the projector, a film cartridge can be used with the projector. A drive mechanism is engaged with the spindle and is selectively operable to rotate the spindle in the rewind



direction, and a drive member is included in the drive mechanism and is engaged with a driven member of the film driving member in each of the two positions of the reel support arm. The drive mechanism includes a normally disengaged selectively operable clutch.

3,677,625

MOTION PICTURE CAMERA WITH DISSOLVING SHUTTER AND VARIABLE-FOCUS LENS

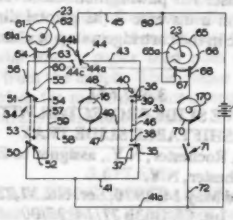
Ralf J. Stolzenwald, Stuttgart, and Peter Korner, Reichenbach, both of Germany, assignors to Robert Bosch Photokino GmbH, Stuttgart, Unterturkheim, Germany

Filed July 23, 1971, Ser. No. 165,651

Claims priority, application Germany, June 31, 1970, P 20 38 089.6

Int. Cl. G03b *21/36*

U.S. Cl. 352—91 **20 Claims**



A motion picture camera with a variable-focus lens and a fading mechanism having a dissolving shutter is provided with two electric motors one of which drives the pull-down for film transport (**70**) and the other of which can selectively adjust the variable-focus lens or the shutter (**16**). The other motor (**16**) is normally connected with the variable-focus lens but can be disconnected from the variable-focus lens and connected with the dissolving shutter during the making of exposures with fade-out or fade-in effect. The other motor (**16**) is reversible and the one motor (**70**) is also of the reversible type if the camera is designed to effect the rearward transport of those film frames which were exposed with fade-out effect in order to expose such film frames with fade-in effect.

3,677,626

IMAGE DISPLAY FROM CONTINUOUSLY MOVING IMAGE CARRIER

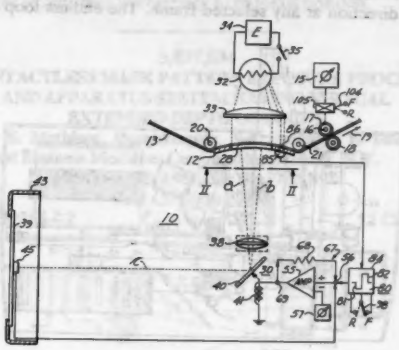
Leonard A. Ferrari, San Dimas, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 11, 1971, Ser. No. 105,393

Int. Cl. G03b *41/10*

U.S. Cl. 352—109 **12 Claims**

Images are displayed from a continuously moving image carrier with the aid of a repeatedly advanced and reset optical compensator. The compensator is reset by electric pulse



doublets which are generated by differentiator and single-stage multivibrator equipment.

3,677,627

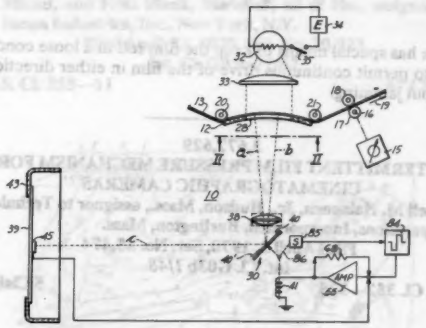
FILM SPROCKET HOLE SENSING

Robert F. Johnston, Wildwood, and Wieslaw Lichodziejewski, Mount Prospect, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Feb. 17, 1971, Ser. No. 116,053

Int. Cl. G03b *41/10*

U.S. Cl. 352—109 **15 Claims**



Film sprocket hole sensing methods project borderline images along with sprocket hole images from film with transparent film margins. The borderline images are darker than the sprocket hole images and adjacent luminous areas arising from the penetration of light through the transparent film margin. Movement of the luminous sprocket holes is sensed by sensing movement of the borderline images with light-sensitive sensing devices.

3,677,628

REVERSIBLE ENDLESS LOOP CARTRIDGE PROJECTOR FOR TEACHING MACHINES

Richard K. Walker, Convent, N.J., assignor to E. R. E. Laboratory, Inc., West Orange, N.J.

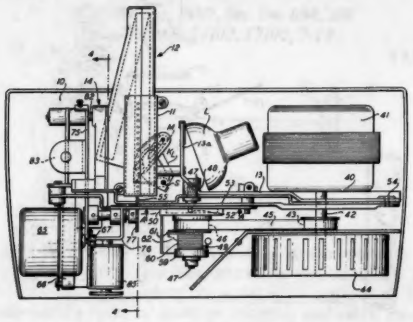
Filed Nov. 2, 1970, Ser. No. 86,076

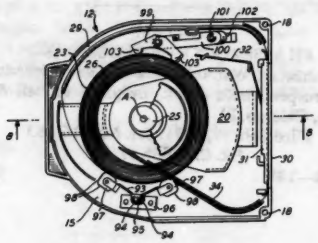
Int. Cl. G03b *21/00, 21/12*; G11b *23/06*

U.S. Cl. 352—128 **10 Claims**

A motion picture projector for educational purposes is provided using an endless loop cartridge. The projector has a step advance for projecting single frames or motion pictures and

has also a continuous drive operable alternatively to scan the film forwardly or rewind the film at high speed and to stop in either direction at any selected frame. The endless loop cartridge has special means to keep the film roll in a loose condition to permit continuous drive of the film in either direction without jamming.



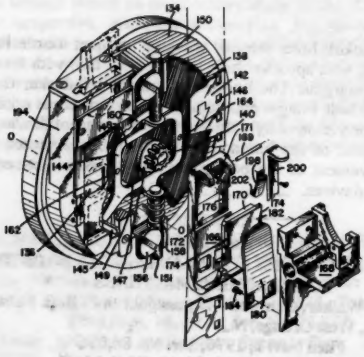


3,677,629

INTERMITTENT FILM PRESSURE MECHANISM FOR CINEMATOGRAPHIC CAMERAS

Russell M. Heinonen, Jr., Hudson, Mass., assignor to Technical Operations, Incorporated, Burlington, Mass.

Filed April 3, 1970, Ser. No. 25,474
Int. Cl. G03b *1/48*
U.S. Cl. 352—225 **5 Claims**



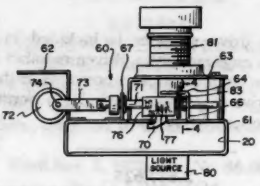
A cine camera has a color-encoding filter disposed on the optical axis with a rear surface thereof contiguous to the film exposure area. An intermittent pressure-applying means presses a film strip into firm engagement with the rear surface of the filter during each exposure interval. The pressure-applying means is driven away from the film by a film pull-down claw during each film advance interval.

3,677,630

AUDIO-VISUAL DISPLAY APPARATUS FOR RECEIVING CARTRIDGES CONTAINING AUDIO VISUAL INFORMATION

Donald V. O'Neal, River Grove, and Edward T. Kizielewski, Chicago, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 20, 1970, Ser. No. 65,451
Int. Cl. G03b *31/00*
U.S. Cl. 353—15 **4 Claims**



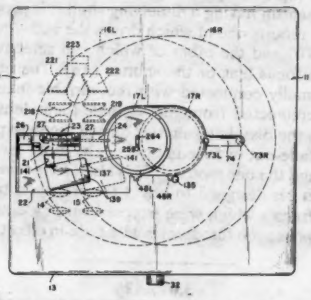
An apparatus for receiving a cartridge having the physical characteristics of an eight track stereo cartridge and capable of playing such eight track cartridges while principally being designed to accommodate cartridges containing audio-visual information. The apparatus has an entryway for receiving the cartridge and a pawl mechanism located in the entryway to be pivotally moved when engaged by the cartridge as it is inserted or removed from the entryway. The pawl rotates into position and enters an opening in the cartridge to engage notches formed in a film disc. The pawl is then selectively axially actuated, in a direction transverse to its pivotal direction, to advance the film disc in the cartridge a step at a time.

3,677,631

LAP DISSOLVE SLIDE PROJECTOR WITH SINGLE SHIFTABLE SLIDE TRAY

George M. Inglis, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 14, 1970, Ser. No. 37,232
Int. Cl. G03b *21/14, 23/00*
U.S. Cl. 353—83 **17 Claims**



A lap dissolve slide projector alternately displays slides supported in two laterally adjacent stationary slide gates provided with corresponding separate objective lens systems. A single multiple compartment slide tray is laterally movable by a tray supporting carriage and cam mechanism into alternate alignment with one gate and then the other, and is also advanced

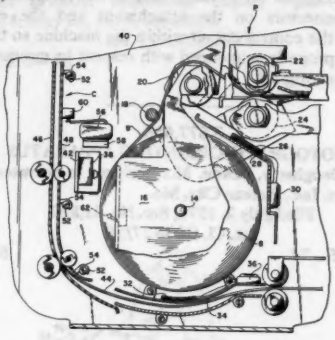
and retracted automatically so that the slides are fed into the projector and displayed in the sequence in which they are initially arranged in the tray and are returned to the tray in the same sequence.

3,677,632

ENVIRONMENT CONTROL DEVICE FOR ELECTROPHOTOGRAPHIC APPARATUS

William A. MacDonald, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 10, 1970, Ser. No. 71,163
Int. Cl. G03g 15/00
U.S. Cl. 355—3 4 Claims



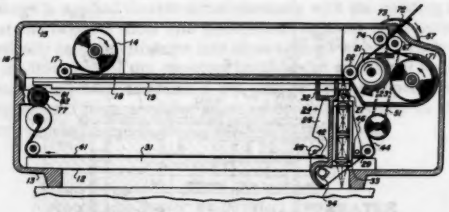
Moisture content of receiver material is controlled within an electrophotographic apparatus by providing one or more heaters in proximity to a supply of receiver material which heaters heat the surrounding air in response to a humidistat control to keep the humidity from exceeding a predetermined level. One of the heaters is arranged to heat both the supply of receiver material and a paper feed path along which the material is fed from the supply. Thus, paper which remains in the feed path when the machine is not operating will be maintained at the correct moisture content.

3,677,633

PORTABLE DOCUMENT ABSTRACTOR

Charles L. Huber, Marion, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 31, 1969, Ser. No. 889,377
Int. Cl. G03g 15/00
U.S. Cl. 355—7 5 Claims



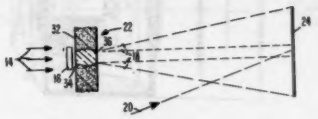
Apparatus for copying various types of information such as words, phrases, sentences, symbols or the like. This complete apparatus, which is adapted to copy selected portions of a complete text, is characterized by the incorporation of a shutter mechanism, which forms an integral part of a carriage transport structure, which carriage transport supports a lens system and lamp therefor, and a charging unit. The shutter is biased in one direction by means of a spring which serves to drive the carriage in the exposing mode. Another part of the shutter is so coupled to manually operable mechanism as to be capable of returning the carriage to its initial position.

3,677,634

CONTACTLESS MASK PATTERN EXPOSURE PROCESS AND APPARATUS SYSTEM HAVING VIRTUAL EXTENDED DEPTH OF FOCUS

Einar S. Mathisen, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1968, Ser. No. 785,898
Int. Cl. G03b 27/28
U.S. Cl. 355—2 12 Claims



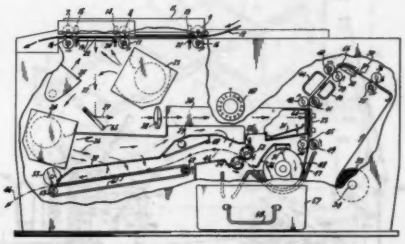
Forming a photoresist mask pattern by employing a three-dimensional mask having non-reflective passages. The mask pattern is recorded on a holographic plate to form a holographic pattern. Thereafter, the holographic pattern is spatially reconstructed so as to form a reconstructed radiation mask pattern having a virtual extended depth of focus defined by the mask entrance and exit images which is used to expose a photo-sensitized surface.

3,677,635

COPYING MACHINE SYSTEM

John A. Van Auken, Miami Beach; Mahlon Gene Kaufman, Miami, and Fritz Blank, Miramar, all of Fla., assignors to Saxon Industries, Inc., New York, N.Y.

Filed April 22, 1970, Ser. No. 30,923
Int. Cl. G03b 27/62
U.S. Cl. 355—11 67 Claims



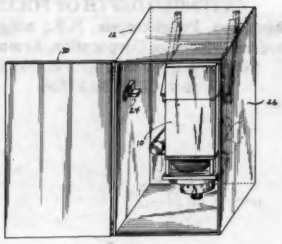
An electrostatic copying machine system including a copying machine and a plurality of attachments therefor to enable the machine to make copies of different types of originals. The attachments include a letter copying bridge for making copies of sheet documents, a book platen for making copies of a page of a book or some other bulky article, and a microfilm scanner for making copies of a microfilm original. At the top of the basic machine there are a plurality of rollers. Each of the attachments is driven by at least one of the machine rollers, so that the original to be copied can be scanned in synchronism with the machine operation. The electrical circuit of the basic machine includes a plurality of terminals extended to respective pins in a connector at the top of the machine. Each of the attachments includes a mating electrical connector which changes the overall circuit of the machine. In this manner, each attachment causes the machine operation to be changed to meet the specific needs of the particular type of original to be copied.

3,677,636

TRANSPORTABLE PHOTOGRAPHIC ENLARGER

Leo Stein, Box 1063, F.D.R. Station, New York, N.Y.

Filed Dec. 12, 1969, Ser. No. 884,475
Int. Cl. G03b 27/32
U.S. Cl. 355—18 7 Claims



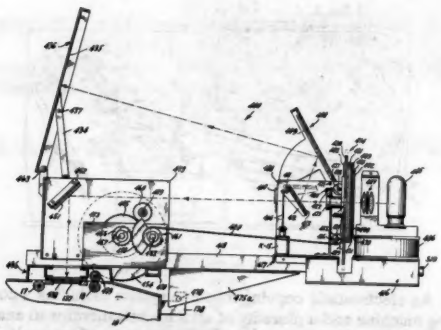
A photographic enlarger having means for mounting the enlarger inside a carrying case, said mounting means adapted to move the enlarger with respect to the case to an operating position where photographic enlargements may be made. The mounting means is adapted to conduct the heat generated in the enlarger during operation to the carrying case where it is dissipated to the atmosphere. The enlarger has a moveable standard containing the enlarging lens with means for locking the standard in the desired position.

3,677,637

MICROFILM ATTACHMENT FOR COPYING MACHINE

John Van Auken, Miami Beach; M. Gene Kaufman, South Miami, both of Fla., and William A. Pfaff, Centerport, N.Y., assignors to Saxon Industries, Inc., New York, N.Y.

Filed April 22, 1970, Ser. No. 30,922
Int. Cl. G03b 13/28
U.S. Cl. 355—45 36 Claims



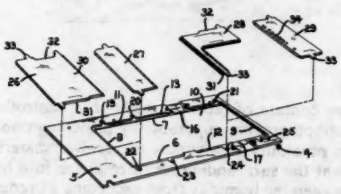
A microfilm attachment for an electrostatic copying machine. The copying machine includes a scanning window and a roller exposed at the upper surface thereof. The microfilm attachment is placed on top of the machine and includes a roller which engages the machine roller. The attachment roller is coupled to a plate which carries a microfilm original to be copied. As the machine cycles, the machine and attachment rollers turn, and the microfilm original is moved. A projection lamp initially images the microfilm on a screen. At the start of the copying cycle, a mirror in the attachment is moved to direct light transmitted through the moving microfilm original to the scanning window for the purpose of exposing copy paper which is moved past an exposure window in the machine at the same time. Because when the microfilm original is initially imaged on the screen it is centrally disposed relative to the machine scanning window, at the start of the copying cycle the microfilm original is actually moved in the reverse direction until it clears the scanning window. Thereafter, it is moved in the forward direction past the scanning window. At the end of the scanning sequence, the microfilm original is returned in the reverse direction to the initial position. The copy paper feed begins while the microfilm original first moves in the reverse direction so that the copy paper reaches the exposure window just when forward movement of the microfilm original is to begin. The microfilm attachment includes several switches which are operated depending upon the position of the microfilm original during the sequence. These switches are extended through connectors on the attachment and the copying machine to the control circuit within the machine so that the machine is properly sequenced with respect to movement of the microfilm original.

3,677,638

PHOTOGRAPHIC PRINTING APPARATUS

Arthur J. Daugherty, Belton, Mo., assignor to Bremson Photo Industries, Inc., Kansas City, Mo.

Filed July 2, 1970, Ser. No. 51,832
Int. Cl. G03b 27/58
U.S. Cl. 355—74 5 Claims



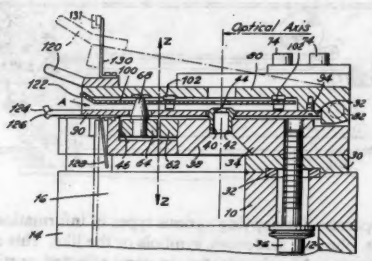
Rapid conversion of commercial photographic projection printing apparatus for producing different print sizes, including multiprint formats, comprises a paper mask frame with a plurality of interchangeable mask members adapted to selectively assemble with the frame for modifying the light transmission opening.

3,677,639

IDENTIFICATION CARD LOCATOR ASSEMBLY

Vernon J. Burzan, Dexter, Mich., assignor to KMS Industries, Inc., Ann Arbor, Mich.

Filed Nov. 6, 1970, Ser. No. 87,424
Int. Cl. G03b 27/62
U.S. Cl. 355—76 10 Claims



A holder for use selectively with an identification card in an identification system to locate the card in proper position relative to an optical axis for photographic exposure or for comparison purposes; the holder has a base plate apertured for the

optical system and provided with registry pins to receive the card in proper location, and a card receiver assembly is positioned to receive a card and movable to shift the card to a registered position on the base plate for use in the optical identification system.

3,677,640

ELECTROSTATIC CONTACT PRINTING DEVICE FOR USE IN A PHOTOGRAPHIC CONTACT PRINTER

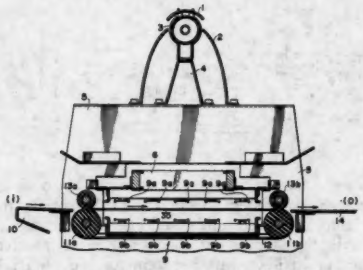
Keiji Nakatani, and Kaoru Takebe, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka-shi, Japan

Filed April 9, 1971, Ser. No. 132,733

Claims priority, application Japan, April 10, 1970, 45/34424; May 21, 1970, 45/49886

Int. Cl. G03b 27/02

U.S. Cl. 355—78 **4 Claims**



In a photographic contact printer, an electrostatic contact printing device comprises an electrode assembly consisting of several pairs of juxtaposed electrodes, each pair of electrodes being oppositely disposed so that an original sheet and a photosensitive sheet which have been superposed pass between. A high electric voltage is applied to the electrodes to create an electrostatic suction force therebetween, and an illuminating light source is located outwardly from the electrodes disposed on the original sheet side, whereby a high electric voltage is applied thereto simultaneously with the printing so that the original sheet and photosensitive sheet are electrostatically enforced to come into close contact with each other. A modification of the structure includes an additional set of electrodes which establish a pre-charge on the superposed original and photosensitive sheet of opposite polarity to the electrostatic charge of the adjoining electrodes.

3,677,641

PHOTOGRAPHIC PRINTING APPARATUS

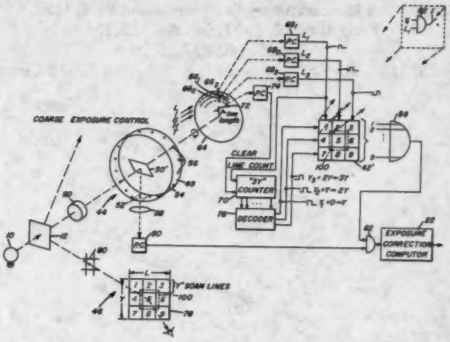
James L. King, Rochester, and Lee O. Arrington, Hamlin, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,299

Int. Cl. G03b 27/78

U.S. Cl. 355—83 **9 Claims**

The need for a manual adjustment to the exposure to be made by a photographic printer having average and point-by-point density determining apparatuses is obviated by a device



for selecting a principal subject area of a negative from which said point-by-point density data is derived.

3,677,642

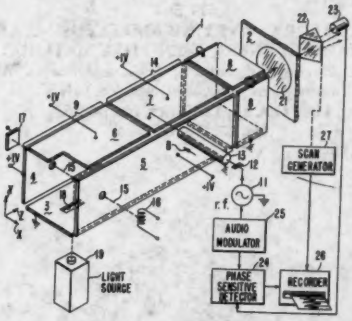
ION CYCLOTRON RESONANCE STIMULATED GLOW-DISCHARGE METHOD AND APPARATUS FOR SPECTRAL ANALYSIS

John D. Baldeschwieler, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Aug. 4, 1967, Ser. No. 658,366

Int. Cl. G01J 3/30

U.S. Cl. 356—85 **5 Claims**

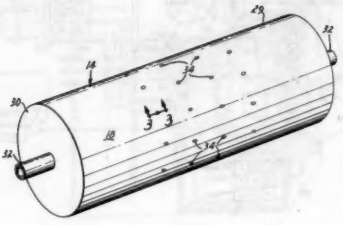


Ion cyclotron resonance stimulated glow-discharge devices are disclosed. In these devices an ensemble of gaseous material comprising at least two different gaseous constituents is ionized to produce ions of at least one of the gaseous constituents. A radio-frequency field at the cyclotron resonance frequency of the ionized gaseous constituent is applied to the gas for exciting cyclotron resonance of the ionized constituent in a magnetic field. The cyclotron resonant ion absorbs energy from the applied radio-frequency field substantially increasing its translational velocity. The cyclotron resonant ion is chemically interacted as by an exchange collision with the second gaseous constituent of the gas sample to produce a gaseous product having an excited electronic energy state. The excited electronic energy state decays by the emission of photons of optical radiation which are extracted from the ensemble of gas for use.

3,677,643
REFLECTIVE PLATEN

Burt K. Sagawa, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed April 20, 1971, Ser. No. 135,704
Int. Cl. G03b 27/20
U.S. Cl. 355—91 10 Claims

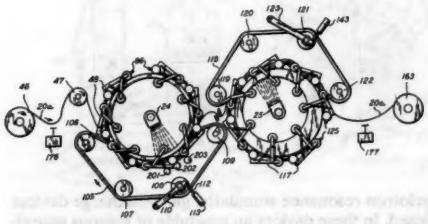


A platen having a wall defining a reflective supporting surface upon which a first sheet of material is to be supported for exposure of graphic intelligence on the first sheet by directing light toward the platen and first sheet to afford reproduction of said graphic intelligence on a second sheet. The wall may be formed with a multiplicity of orifices communicating between the first sheet on the supporting surface and a means for reducing air pressure in the orifices to attract the first sheet to the platen. A recess in the supporting surface defined by a converging wall is formed about each orifice. The converging wall is formed to reflect incident light through the discontinuity in the supporting surface defined by the recess in generally an even intensity across the discontinuity and with generally the same intensity as light is reflected by the supporting surface thereby destroying the reflected image of the orifices and recesses at the supporting surface.

3,677,644
APPARATUS FOR CONVEYING AND EXPOSING A STRIP OF RADIANT ENERGY SENSITIVE MATERIAL

Richard A. Harris, Greensboro, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Oct. 13, 1970, Ser. No. 80,365
Int. Cl. G03b 27/06
U.S. Cl. 355—96 12 Claims

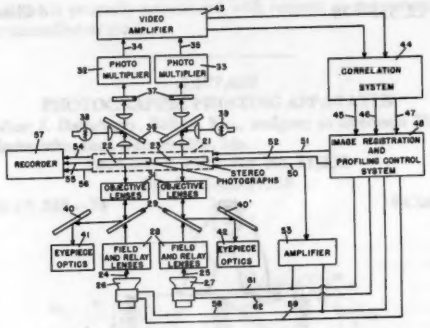


An apparatus for conveying and exposing a radiant energy sensitive strip of material, such as flexible printed circuit material, utilizes a plurality of carriages movable along closed tracks. Each carriage has a mask thereon against which the strip is pressed as the carriages are moved past a radiant energy source. Each mask is mounted free to move within predetermined limits relative to the carriage so that registration pins on each mask can be accurately aligned with registration holes punched in successive sections of the strip. The tracks along which wheels on the carriages roll include a plurality of circular outwardly facing and inwardly facing tracks located in parallel planes. Each carriage has spring biased arms with wheels engaging the inwardly facing tracks to retain the carriages on the tracks. In a second carriage and track arrangement, the inwardly facing tracks are eccentric with the outwardly facing tracks so that the spring biased arms urge the carriage toward the point when the inwardly facing tracks are closest to the outwardly facing tracks.

3,677,645
AUTOMATIC STEREOPLOTTING APPARATUS HAVING A LOW INERTIA SERVO SYSTEM

H. Ronald Johnston, Vancouver, British Columbia, Canada, assignor to Itek Corporation, Lexington, Mass.

Filed June 1, 1970, Ser. No. 42,096
Int. Cl. G01c 11/12
U.S. Cl. 356—2 6 Claims

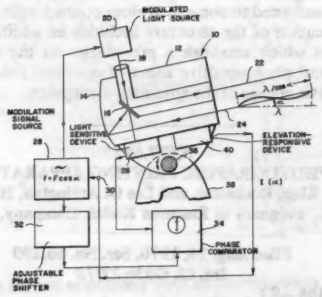


An automatic stereoplotting system employing both a high speed primary servo-system for inducing substantially instantaneous primary relative displacements between scanning patterns to eliminate detected parallax, and a more massive and slower reacting auxiliary servo system for inducing relative displacements between photographs being scanned. The auxiliary displacements of the photographs replace the initial primary displacements of the scanning patterns and a readout mechanism records measured elevations by continuously indicating the algebraic summations of both the primary and auxiliary displacements.

3,677,646
INSTRUMENT FOR MEASURING DISTANCE

Carl Erik Granqvist, Lidingo, Sweden, assignor to Aga Aktiebolag, Lidingo, Sweden

Filed Sept. 8, 1969, Ser. No. 856,130
Claims priority, application Sweden, Sept. 12, 1968, 12253/68
Int. Cl. G01c 3/08
U.S. Cl. 356—4 5 Claims



A distance measuring instrument of the type wherein a modulated beam of light is transmitted along a path to be mea-

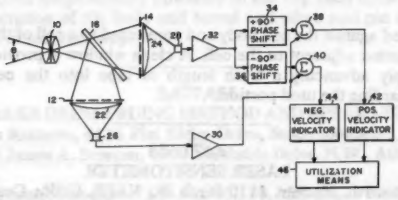
sured, the light is reflected at the distance to be measured and received at the instrument, and a comparison is made between the modulation phase of the received signal and that of the transmitted signal to determine the distance in terms of the wavelength of the modulation signal, includes an arrangement for varying the wavelength in inverse proportion to the sine or cosine of the angle of elevation whereby the measurement obtained is related to the vertical or horizontal projection of the distance irrespective of the elevation of the instrument.

3,677,647

ELECTRO-OPTICAL TARGET MOTION SENSOR

Victor A. Misek, Hudson, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 17, 1970, Ser. No. 66,156
Int. Cl. G01p *3/36*; G01c *1/00*
U.S. Cl. 356—28 **10 Claims**



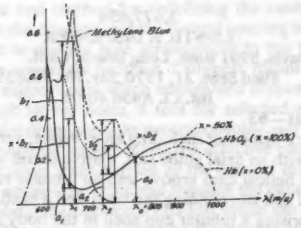
An electro-optical target motion sensor comprises a pair of photodetector elements upon which an image is focused through cross correlation gratings which are spatially phase shifted with respect to one another. The detector outputs are electrically phase shifted and processed to provide output signals representative to the velocity and direction of motion of a target image.

3,677,648

METHOD AND APPARATUS FOR THE MEASUREMENT OF DYE DILUTION IN BLOOD

Johannes Dorsch, Schonhausenstrasse 11, Bremen, Germany

Continuation of Ser. No. 416,863, Dec. 8, 1964, abandoned. This application June 22, 1970, Ser. No. 48,194
Int. Cl. G01n *33/16*
U.S. Cl. 356—40 **2 Claims**



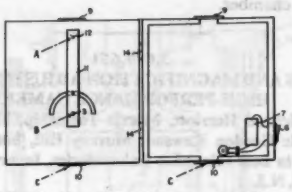
A method for determining cardiac volume parameters wherein a test dye is added to blood and a photometric measurement of the light absorption of dyed blood is carried out by an electro-optical system which includes a photosensitive means to determine dye dilution in the blood.

3,677,649

SIMPLE SPECTROMETER

Keiji Miyashita, 18-10, 5-chome, Kami Renjaku, Tokyo, Japan

Filed Nov. 4, 1970, Ser. No. 86,674
Claims priority, application Japan, Dec. 17, 1969, 44/100880
Int. Cl. G01j *3/28*
U.S. Cl. 356—74 **3 Claims**



A simple spectrometer. A box has a top with a first lever pivotally mounted on the outside surface of the top at a point B with a scale moving needle on the end thereof spaced from the pivot a distance equal to the distance between point B and a point A. A graduated wave length scale is pivotally mounted on the top at point A and is coupled to the first lever for pivotal movement around point A as the first lever pivots around point B and in proportion to the movement of the first lever. A second lever is mounted on the inside surface of the top for movement about said point B and is coupled to the first lever for movement with the first lever. A spectrum registering needle is mounted on the free end of the second lever and projects into the box. The box has an opening in the side at a point C in line with points A and B and a replica of a diffraction grating is mounted in the opening. The box further has a slit in the side thereof opposite the diffraction grating. Light means are provided within the box controllable from outside of the box for illuminating the spectrum-registering needle. When light comes through the slit and falls on the replica of the diffraction grating and the levers are moved to locate the spectrum registering needle in register with the line spectrum on the replica of the diffraction grating, the scale moving needle moves along the graduated scale to indicate the wave length of the line spectrum.

ERRATUM

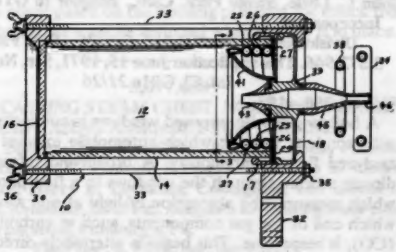
For Class 356—85 see:
Patent No. 3,677,642

3,677,650

APPARATUS FOR ACCUMULATING AND DISPLAYING FINE PARTICLES IN A GAS

George A. Klingler, 300 Patterson Road, Dayton, Ohio

Filed June 28, 1971, Ser. No. 157,136
Int. Cl. G01n *21/00*
U.S. Cl. 356—103 **6 Claims**



A particle accumulator display having a closed transparent chamber with a plurality of input nozzles to provide a vortex

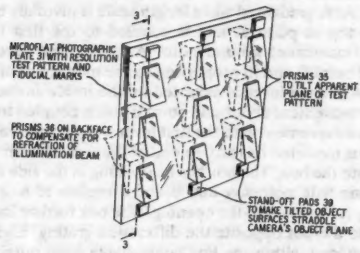
flow within the chamber. An ejection nozzle is centrally located within the chamber at the end adjacent the input nozzles. The input nozzles and ejection nozzles are spaced apart with an approximately bell shaped flow stabilizer being positioned between them. The chamber is enclosed in a light tight housing with a viewing eyepiece positioned at the end remote from the input and ejection nozzles, and a second eyepiece adapted to be adjustably positioned around the chamber. A light is provided to illuminate particle columns accumulated within the chamber.

3,677,651

FOCUS AND MAGNIFICATION ADJUSTMENT OF A HIGH-PERFORMANCE CAMERA

Donald Richard Herriott, Morris Township, Morris County, and Eric Gordon Rawson, Murray Hill, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 29, 1970, Ser. No. 76,549
Int. Cl. G01b 9/00
U.S. Cl. 356—126 **9 Claims**


MICROFLAT PHOTOGRAPHIC PLATE 31 WITH RESOLUTION TEST PATTERN AND FIDUCIAL MARKS
PRISMS 35 TO TILT APPARENT PLANE OF TEST PATTERN
PRISMS 36 ON BACKFACE TO COMPENSATE FOR REFRACTION OF ILLUMINATION BEAM
STAND-OFF PADS 39 TO MAKE TILTED OBJECT SURFACES STRADDLE CAMERA'S OBJECT PLANE

A method and apparatus are disclosed for adjusting the location of the image and object planes of a camera to minimize focus and magnification errors. A special test reticle is used comprised of at least one, and preferably nine, test patterns on one side of the reticle. Over each pattern a first prism is mounted to tilt the apparent plane of the test pattern as seen in the prism and a second prism is ordinarily mounted to the other side of the reticle to compensate for the refraction due to the first prism. In use, the test reticle is placed in the object plane of the camera and a test image plate is exposed and developed. The sharpest points in the image of each of the tilted test patterns as well as the spacing between certain fiducial marks are then measured. From this data are derived the corrections that should be made in the positions of the object and image planes. With six to eight iterations of this procedure, good adjustment of the camera is achieved.

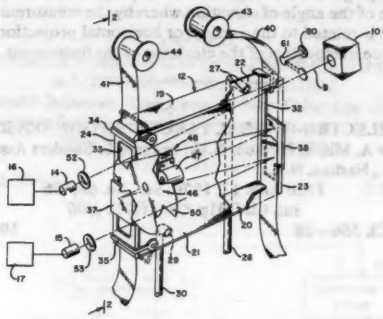
3,677,652

FLUID ANALYZER APPARATUS

John C. Little, Menlo Park, Calif., assignor to GTE Sylvania Incorporated

Division of Ser. No. 802,541, Feb. 26, 1969, Pat. No. 3,572,946. This application June 15, 1971, Ser. No. 57,417
Int. Cl. G01n 21/26
U.S. Cl. 356—183 **5 Claims**

A hollow cell with opposed windows is connected in series with conduits through which automobile exhaust gas to be analyzed flows continuously. A broadband infrared source directs a beam through the windows to a first photodetector which measures the absorption of light at one wavelength to which one of the gas components, such as carbon monoxide (CO), is responsive. This beam is alternately directed over a longer path through the cell by a reflective chopper wheel adjacent the exit window and by mirrors mounted outside both windows to another photodetector which measures absorption of light at a different wavelength corresponding to another component, such as a hydrocarbon (HC). The outputs of both photodetectors are utilized to give continuous direct readout of the concentrations of the components. Each window is formed with a length of transparent plastic tape releasably



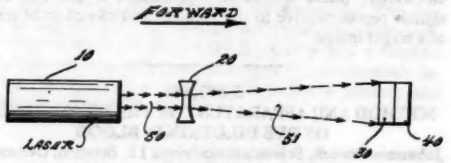
sealed against the cell body and connected to a roll of the tape mounted adjacent to the cell. A clean window is provided by simply advancing a fresh length of tape into the cell and discarding the used portion.

3,677,653

LASER SENSITOMETER

Richard L. Hocker, 1110 Birch St., VAFB, Calif.; Conrad P. Czerniejewski, 7550 Norwood Ave., Melbourne, Fla., and John D. Hopper, 1389 Stanley Lane, Melbourne, Fla.

Filed Oct. 23, 1970, Ser. No. 83,563
Int. Cl. G01j 1/52
U.S. Cl. 356—256 **1 Claim**



A laser and a negative lens are used in a sensitometer to produce a diverging beam of coherent monochromatic light which is desirable in making sensitometric test strips from light-sensitive material that is being tested for resolution response.

3,677,654

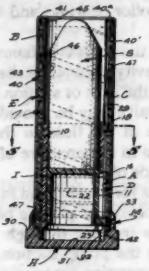
LIPSTICK DISPENSER

Hazel E. Davis, 5901 Rose, Long Beach, Calif.

Filed Sept. 21, 1970, Ser. No. 73,835
Int. Cl. A45d 40/06
U.S. Cl. 401—63 **2 Claims**

A lipstick dispenser including an elongate, vertical cylindrical body with an axial guide slot, a drive barrel with an axially extending helical cam groove and an annular race way at its upper end and surrounding the body and a lipstick supporting cup comprising a tubular cup shell in the body and having an axially extending guiding slot and a cam pin engaged through the guide slot and into engagement in the groove and a cup bottom normally engaged in the lower portion of the cup shell and having a cam lug engaged through the guide and guiding slots and into the groove; an elongate lipstick with a base portion normally engaged in the upper portion of the cup shell and engaging the cup bottom, the cup shell and cup bottom

adapted to be moved longitudinally in the body together upon relative rotation of the body and barrel and when the pin and lug are engaged in the groove and said cup bottom adapted to



be moved longitudinally upwardly in the cup shell upon relative rotation of the body and barrel and when said pin is engaged in said race way.

3,677,655

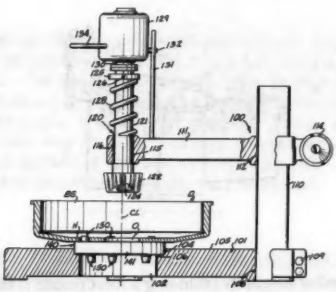
BRAKE DRUM TRUING METHOD AND APPARATUS

James Ratteree, 4126 Flat Ridge Drive, Stone Mountain, Ga., and James A. Seaman, 4900 Northside Drive, N.W., Atlanta Ga.

Continuation-in-part of Ser. No. 40,120, May 25, 1970. This application Nov. 5, 1970, Ser. No. 87,146

Int. Cl. B23b *35/00*

U.S. Cl. 408—1 **10 Claims**



Apparatus and method for redefining the central opening through a brake drum so that the central opening is concentric with respect to the lug hole arrangement in the brake drum wherein the apparatus includes a support means carrying a plurality of support pins which engage and support the brake drum through its lug holes, a tool for selected engagement with the brake drum about its central opening and positioning means for locating the tool along the effective rotational axis of the brake drum when carried by the support means so that the tool can engage the drum and redefine the central opening concentric about the rotational axis and within the lug hole arrangement. The support pins may be mounted in an adapter so as to provide for different lug hole arrangements.

The method includes supporting a brake drum to have its central opening redefined; positioning a tool concentrically within the lug hole arrangement; and engaging the brake drum about its central opening with the tool while maintaining its concentricity with respect to the lug hole arrangement to redefine the central opening.

3,677,656

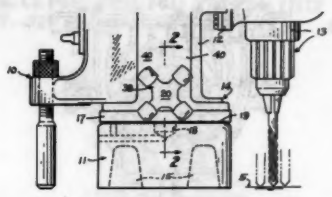
RADIAL POSITIONER, LOCK AND ROTARY CONTACTS FOR ELECTROMAGNETIC DRILL MOUNT

Eugene W. Buck, 110 Lansberry Court, Los Gatos, Calif.

Continuation-in-part of Ser. No. 857,114, Sept. 11, 1969, abandoned. This application Feb. 19, 1971, Ser. No. 116,950

Int. Cl. B23b *45/14*

U.S. Cl. 408—76 **11 Claims**



For the rotary mount of a drill press support mounted on a rotary bearing plate having a diametrically extending open center mounted on a center pin extending upwardly from a fixed base, rotary electrical contacts in the center pin eliminating twisting of the wires therein and a radial positioner and locking means in the form of a radially extending lever offset from the drill on the drill press support and threaded to a yoke circumscribing the center pin and confining rollable members between spaced races on the pin for pressing the rotary bearing plate into locked engagement with the fixed base.

3,677,657

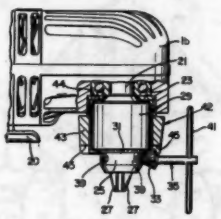
CHUCK GUARD

William S. Brucker, Towson, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Sept. 3, 1970, Ser. No. 69,331

Int. Cl. B23b *47/00*; B23q *11/08*

U.S. Cl. 408—241 G **9 Claims**



A portable electric drill including a housing having a motor driven chuck rotatably supported thereon. The chuck is the conventional jaw-type which utilizes a key to open and close the jaws and secure a tool bit therein. A lever on the housing is movable to turn the motor on and rotate the chuck and tool bit, and a novel guard on the housing prevents the chuck from turning should the lever be actuated when the key is in place.

3,677,658

SPLIT CASTING STEAM CHEST, NOZZLE CHAMBER AND CASING ASSEMBLY FOR TURBINES

Philip A. Dinenno, Jr., Glenriddle; Joseph S. Bonk, Philadelphia; Kenneth C. Conrad, Springfield; Rodney S. Moore, Broomall; Harry E. Lochman, Collingdale, and Daniel D. Torello, Avondale, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

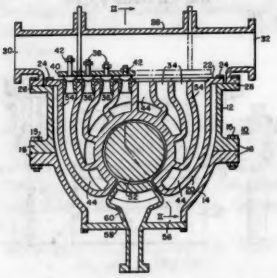
Filed Dec. 8, 1970, Ser. No. 95,997

Int. Cl. F01d *1/00*; F04d *29/40*

U.S. Cl. 415—108 **6 Claims**

In an elastic fluid turbine, an improved construction of the casing, the steam chest and the nozzle chamber which permits

free expansion of parts subject to thermal transients at reduced cost and higher assurance of quality. This is accomplished by casting the nozzle chamber, the upper and lowe halves of the outer casing and at least a portion of the steam chest as separate pieces and then bolting them together. In



cases where a high pressure nozzle chamber is employed, this also is cast separate from the lower casing half and fitted into an opening in that part. Forming the assembly from a number of parts in this manner considerably reduces the problems encountered in casting complex shapes which are costly and difficult to fabricate.

3,677,659

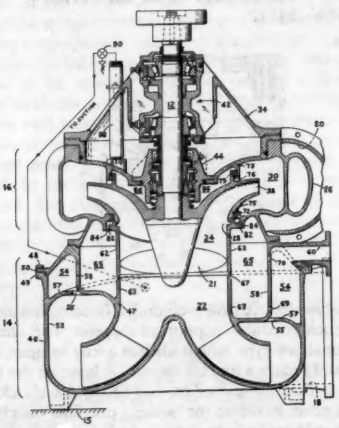
MULTI-STAGE PUMP AND COMPONENTS THEREFOR

John G. Williams, Warren Township, Somerset County, N.J., assignor to Worthington Corporation, Harrison, N.J.

Filed July 31, 1970, Ser. No. 59,928

Int. Cl. F01d *11/00*

U.S. Cl. 415—111 **17 Claims**



A multi-stage pump including a casing having an inducer section and at least one impeller section. A shaft rotatably driven by a suitable prime mover extends into the casing and the inducer and the impeller or impellers as the case may be in the casing are mounted on and are rotatable with the shaft.

Novel spaced tapered roller bearing assemblies support the shaft, each bearing assembly being separately lubricated by a lubricant, e.g. grease, which is pumped by the action of the roller bearings through connected chambers and passages about the respective roller bearing assemblies. The spaced roller bearing assemblies are stressed for rigidity in assembled position by a telescoping piston means which defines a fluid chamber into which any suitable fluid can be introduced to force the piston means to engage and exert stress on the outer races of the respective tapered roller bearing assemblies for maintaining the tapered rollers thereof in contact with the races at all times during operation. Alternatively, slingers can be mounted for rotation with the shaft adjacent each of the tapered roller bearing assemblies for assisting the pumping action of the tapered roller bearings and for dissipating bearing heat.

Axial thrust along the shaft is balanced by a fluid line connecting a leakage cavity behind the back shroud of the last mounted impeller to the inlet or suction side of the impeller. A pressure regulating valve may be provided in the fluid line for varying the pressure of the fluid in the leakage cavity as a function of variations in the pressure of the fluid flowing into the inlet or suction side of the pump.

The pump provides for a reduction in cavitation at low load conditions by withdrawing or passing back flowing fluid from the periphery of the inducer through a leakage passage in communication with the pump suction. Additionally, cavitation over the entire operating range of the pump is reduced by communicating the leakage joints of the impeller casing wearing rings with the pump suction.

Also disclosed is novel casing structure for withdrawing gases from suction fluid, withdrawn back flow fluid and fluid leakage from the wearing rings.

3,677,660

PROPELLER WITH KORT NOZZLE

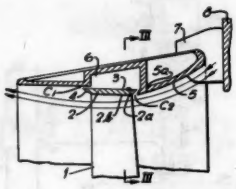
Kaname Taniguchi; Fujio Furukawa; Tomiro Hisatome, and Yoshito Kimura, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed March 31, 1970, Ser. No. 24,313

Claims priority, application Japan, April 8, 1969, 44/26586; June 30, 1969, 44/51085

Int. Cl. B63h *1/16*

U.S. Cl. 415—172 **3 Claims**



A propeller assembly including a Kort nozzle is formed of a plurality of propeller blades mounted for rotation on a shaft. The Kort nozzle circumferentially encloses the outer edge of the propeller blades and has an outwardly extending annular groove formed in its inner surface arranged opposite the outer edges of the blades. Secured to the outer edges of the blades for rotation therewith, is an annular member which forms a closure for the opening to the annular groove in the nozzle. The annular member is positioned in combination with the inner surface of the Kort nozzle to form a pair of narrow openings to the annular groove spaced apart in the propulsion direction of the propeller assembly.

3,677,661

PUMP

Paul D. Pickens, 5746 Dolphin Place, La Jolla, Calif.

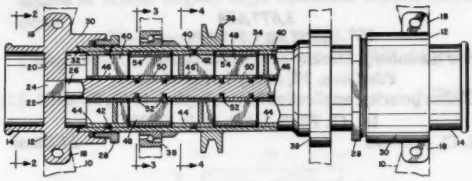
Filed Dec. 14, 1970, Ser. No. 97,806

Int. Cl. F04d *1/4, 3/02*

U.S. Cl. 415—199 **2 Claims**

A multiple stage, axial flow, reversible pump for fluids and featured by a rotary barrel, driven externally and carrying multiple stage impeller vanes which rotate in relation to stator

vanes fixed to an axial shaft which is itself fixed against rotation. The alternating rotating vanes and stator vanes are also



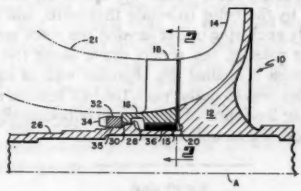
alternately as well as removably secured to the barrel and shaft so that assembly and repair are facilitated.

3,677,662

MULTILAYER RING DAMPED TURBOMACHINE ROTOR ASSEMBLY

Val Cronstedt, Williamsport, Pa., assignor to Avco Corporation, Williamsport, Pa.

Filed Oct. 9, 1970, Ser. No. 79,550
Int. Cl. F01d *5/26*
U.S. Cl. 416—183 **4 Claims**



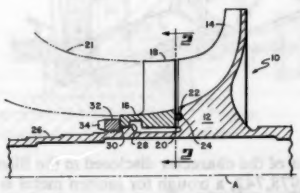
The disclosure illustrates a centrifugal compressor comprising an inducer hub telescoped over an adjacent shoulder of an impeller hub. The inducer hub has an inner annular surface which receives a plurality of stacked annular relatively thin split ring elements. When the compressor rotates at high r.p.m.'s the split rings frictionally engage one another and the inner annular surface of the inducer hub to provide a highly effective means for damping vibrations in the inducer.

3,677,663

DAMPED TURBOMACHINE ROTOR ASSEMBLY

Val Cronstedt, Williamsport, Pa., assignor to Avco Corporation, Williamsport, Pa.

Filed Oct. 1, 1970, Ser. No. 77,146
Int. Cl. F01d *5/26*
U.S. Cl. 416—183 **4 Claims**



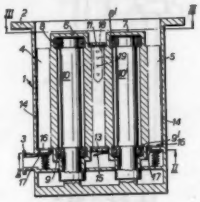
The disclosure illustrates a centrifugal compressor comprising an inducer hub telescoped over an adjacent shoulder of an impeller hub. A nut threaded on the impeller hub maintains the inducer hub, an intermediate annular resilient ring and the impeller hub in abutment with sufficient pressure to damp vibrations in the rotor assembly.

3,677,664

ROTARY MECHANICAL PUMPS OF THE SCREW TYPE

Henryk Wycliffe, Crawley, and Basil Dixon Power, Horsham, both of England, assignors to Edwards High Vacuum International Limited, Crawley, Sussex, England

Continuation of Ser. No. 759,952, Sept. 16, 1968, abandoned. This application June 29, 1970, Ser. No. 50,049
Claims priority, application Great Britain, Sept. 21, 1967, 42965/67
Int. Cl. F04b *49/00*; F01c *1/16*; F04c *17/12*
U.S. Cl. 417—310 **6 Claims**



An oil-sealed screw rotor mechanical vacuum pump which may be used as a backing pump, together with a rotary dry-running fine pump, in a high vacuum pumping unit. The screw rotor pump has one or more non-return valves between the chambers being limited by the screw rotor action and the atmosphere. The sealing oil also acts as a "liquid piston" to sweep pumped medium out of the chambers via the non-return valve(s).

3,677,665

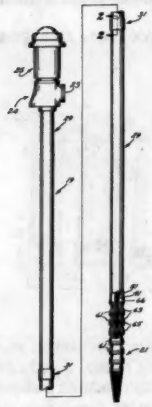
SUBMERSIBLE PUMP ASSEMBLY

John L. Corkill, Calgary, Alberta, Canada, assignor to Husky Oil Ltd., Calgary, Canada

Filed May 7, 1971, Ser. No. 141,107
Int. Cl. F04b *17/00, 35/04*; F01c *1/10, 5/00*
U.S. Cl. 417—410 **6 Claims**

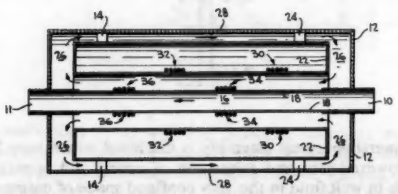
A submersible pump assembly is disclosed which may be readily lowered into and raised out of casing and operated downhole in well fluid in the very confined space of casing of an oil well. The submersible pump assembly includes a progressive cavity pump of the Moineau type with a helical stator and a helical rotor. A submersible electric motor filled with a lubricating fluid is located below the pump and drives the pump through a speed reducer. A pressure equalizer is included which provides a pressure equalizer lubricating fluid reservoir for the electric motor and the speed reducer and allows for expansion and contraction in the volume of lubricating fluid. Several embodiments of the submersible pump assembly are disclosed.

3,677,666
CLOSE TOLERANCE PIPE APPARATUS
Frank W. Tybus, 9060 Rosecrans Ave., Bellflower, Calif.
Filed June 25, 1970, Ser. No. 49,776
Int. Cl. F04b *17/00, 35/04;* F03b *13/02*
U.S. Cl. 417—424 9 Claims



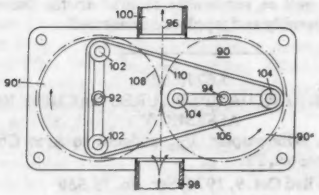
A close tolerance pipe apparatus including a column of pipe lengths formed on their respective opposite extremities with male and female extremities which connect together to form joints. The female extremities are integral with the respective pipe lengths and are expanded to telescope over the respective male extremities. Stop means is secured in the female extremities of the respective pipe lengths and are disposed at a selected distance from the male end of such respective pipe lengths. The male extremities are externally threaded and the female extremities internally threaded whereby the male extremities may be screwed into the female extremities sufficiently far to abut the ends of the male extremities against the respective stop means to thereby provide an overall length for the total pipe column which is the cumulative distance between the stop means and male ends of the respective pipe lengths.

3,677,667
PERISTALTIC FLUID PUMP
Clyde A. Morrison, 4205 Dahill Road, Wheaton, Md.
Filed Aug. 28, 1970, Ser. No. 67,816
Int. Cl. F64b *43/12*
U.S. Cl. 417—474 2 Claims



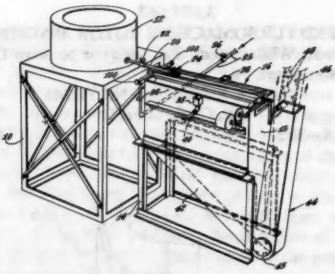
A peristaltic pump embodying a tube formed of flexible material surrounded by a chamber that contains a ferromagnetic fluid. A plurality of electrically conducting loops are placed circumferentially around the flexible tube in the vicinity of the ferromagnetic fluid. The conducting loops are sequentially energized along the length of the flexible tube in such a manner that the resultant force on the ferromagnetic fluid causes the portion of the flexible tube in the vicinity of the energized loops to flex in a predetermined manner. This action provides a motive force that advances fluid through the tube in any selected manner.

3,677,668
ROTARY PUMPS
Peretz Rosenberg, Moshav Beit Sherim, Israel
Filed Aug. 17, 1970, Ser. No. 64,449
Claims priority, application Israel, Sept. 9, 1969, 32970
Int. Cl. F04b *43/08;* F04c *17/00*
U.S. Cl. 418—45 2 Claims



A rotary pump comprises a chamber having an inlet port and an outlet port, a rotor within the chamber, one or more rollers carried by the rotor to rotate therewith, and a closed-loop belt tightly enclosing under tension the rotor and rollers. As the rotor is rotated, the rollers move along the belt and continuously press it against the chamber wall as each roller moves from inlet port to outlet port, the belt tension maintaining intermediate free runs of the belt in substantially straight lines spaced from the chamber wall.

3,677,669
APPARATUS FOR PRODUCING METAL SHOT
Louis W. Bliemeister, 5410 W. 99th St., Los Angeles, Calif.
Continuation-in-part of Ser. No. 773,230, Nov. 4, 1968, abandoned. This application May 5, 1969, Ser. No. 825,115
Int. Cl. B22c *23/00*
U.S. Cl. 425—6 29 Claims



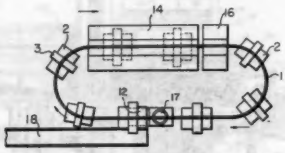
In an apparatus of the character disclosed in the Bliemeister U.S. Pat. No. 2,978,742, a trough for molten metal is heated on both sides and has two rows of orifices to release drops of metal into a body of quenching solution onto submerged interrupter means. The orifices are formed by a stack of orifice plates that are individually slidable for individual thermal expansion. The trough is vibrated by means operating on the principle of a tuning fork.

3,677,670

ROTATIONAL MOLDING APPARATUS

Hisayuki Mori, and Yoji Noguchi, both of Nara, Japan, assignors to Sekisui Kegaku Ogyo Kabushiki Kaisha, Osaka, Japan

Filed June 2, 1970, Ser. No. 42,721
Claims priority, application Japan, Aug. 13, 1969, 44/77226
Int. Cl. B29c 5/04
U.S. Cl. 425—62 8 Claims



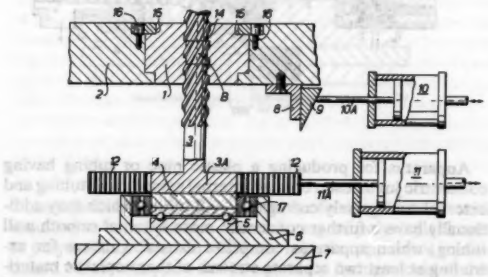
A rotational molding apparatus comprising one or more annular tracks, a plurality of drive carriages traveling along said tracks, rotary molds each of which being supported by supporting means are coupled to said several carriages through the intermediary of said supporting means, rotatory mechanisms each of which transmits a rotational motion to a rotating shaft of each of said several molds from a drive source disposed in each of said carriages, a heating tunnel for each of said annular tracks, said tunnel housing a part of said annular track and permiting the passage therethrough of said carriages and molds, and a cooling tank for each said annular tracks, said cooling tank being provided in the course of the molds emerging from the heating tunnel after passage therethrough, said cooling tank being adapted to cool said molds as they pass therethrough. The apparatus is suitable for the mass production of synthetic resin molded articles of good quality with improved productive efficiency and ease of controlling production and heating temperature.

3,677,671

APPARATUS FOR FORMING HELICAL GEAR WHEEL BODIES FROM POWDER

Anthony Michael Martin, Elm Gables, Beechwood Ave., Little Chalfont, Buckinghamshire, England

Filed Feb. 2, 1970, Ser. No. 7,864
Claims priority, application Great Britain, Feb. 1, 1969, 5,559/69
Int. Cl. B30b 3/06, 11/14
U.S. Cl. 425—78 3 Claims



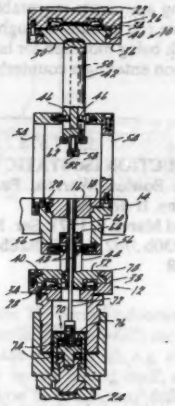
The disclosure is of an apparatus for forming helical gear wheel bodies by compacting initially powdery materials in dies by pressure between punches, the dies having mould cavities with helical grooves and there being positive controlled rotation of the dies and punches in relation to one another during the compaction and ejection operations by hydraulic or pneumatic systems including sensing means and drive means.

3,677,672

APPARATUS FOR THE MANUFACTURE OF POWDER METAL HELICAL GEARS

Jerry E. Harrington, Center Line, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed March 12, 1970, Ser. No. 18,948
Int. Cl. B30b 3/00, 11/02
U.S. Cl. 425—78 6 Claims



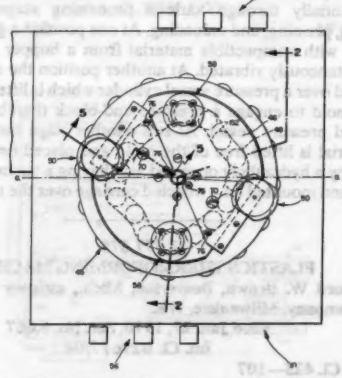
Apparatus for pressing powder metal helical gears and similar articles of manufacture wherein the powder is pressed with a twisting motion of the punches. A cam arrangement is described for a pressing apparatus which rotates the punches during pressing.

3,677,673

ROTARY PRESS

Leonard Shapiro, Upper Darby, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 25, 1970, Ser. No. 66,774
Int. Cl. B29c 3/04
U.S. Cl. 425—78 27 Claims



A press has a table which rotates about a vertical axis. Within the table is mounted a plurality of molds which are symmetrically distributed about the vertical axis, each mold having a cavity extending therethrough, the axis of each cavity being parallel to the vertical axis. A plurality of anvils are mounted for radial sliding movement across the upper surface of the table, and a plurality of punches are mounted below the

table, there being one anvil and one punch associated with each mold. As the table, anvils, and punches rotate as a unit, stationary cams effect movement of each anvil and punch in a coordinated manner: (1) the punch enters the cavity from below and presses powdered material against the anvil; (2) the anvil moves radially inwardly from over the cavity; (3) the punch moves further upwardly to eject the manufactured article onto the table; (4) the punch moves downwardly; and (5) the anvil moves radially outwardly to clear the table of excess powder, and move the article into a receptacle mounted to the table, there being a separate receptable associated with each mold. Also, a core rod extends through the punch and into the cavity, the punch being mounted for lateral movement so that it is centered upon entering a counterbore at the lower end of the cavity.

3,677,674

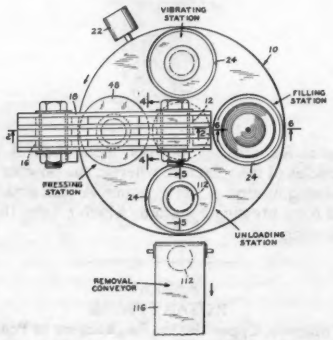
HIGH PRODUCTION ISOSTATIC MOLDING DEVICE

Arnold Gordon Bowles, Warren, Pa., assignor to National Forge Company, Irvine, Pa.

Filed March 9, 1971, Ser. No. 122,379

Int. Cl. B30b *5/02, 11/02;* B28b *3/00;* B29c *6/02*

U.S. Cl. 425—78 **9 Claims**



A high production isostatic molding device comprising an upright, yoke type isostatic press and a turntable for rotating a plurality of elastomeric molds, hung beneath the table, sequentially through various processing stages including filling, pressing, and unloading. At one position a given mold is filled with compactible material from a hopper while being simultaneously vibrated. At another position the mold is positioned over a pressure vessel cylinder which is lifted up around the mold to engage a pressure end-block thereby forming a sealed pressure vessel. At still another stage the compacted material is lifted free of the mold and placed on a conveyor belt by a hydraulicly operated arm having a vacuum pad at its end and mounted on a wheeled carriage over the turntable.

3,677,675

PLASTICS THERMOFORMING MACHINE

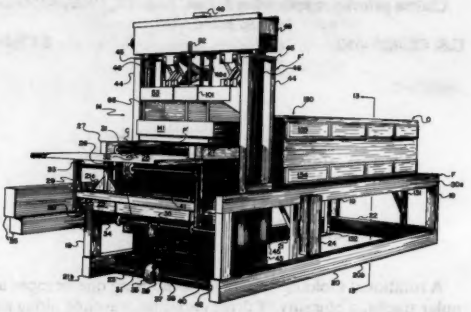
Gaylord W. Brown, Beaverton, Mich., assignor to Koehring Company, Milwaukee, Wis.

Filed Jan. 27, 1970, Ser. No. 6,067

Int. Cl. B29c *17/04*

U.S. Cl. 425—107 **28 Claims**

A synthetic plastics thermoforming machine including relatively axially separable and closeable mold mechanism with platens and molds releasably supported thereon and advancing sheet assemblies for supporting a plastic sheet to be formed in position to be molded upon closing movement of the mold mechanism. A fluid pressure operated ram for moving one of the molds toward the other is mounted on a frame member which is movable relative to the platen and mold. Half bearing members carried by the platen and supporting it for movement on frame structure guide rods is also included and mechanism is provided for moving the bearing members



outwardly from the platen. A plastic sheet preheating oven is incorporated and is movable to a position in which operating shocks are prevented from being transferred to it.

3,677,676

APPARATUS FOR FORMING PLASTIC TUBING HAVING A SMOOTH INNER WALL AND A CORRUGATED OUTER WALL

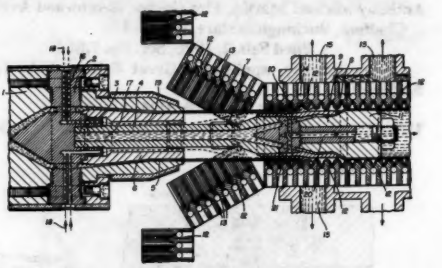
Wilhelm Hegler, Goathestrasse 2, Bad Kissingen, Germany

Division of Ser. No. 676,430, Oct. 19, 1967, Pat. No. 3,538,209. This application May 11, 1970, Ser. No. 1,933

Claims priority, application Austria, Feb. 27, 1967, A 1880/67

Int. Cl. B29d *23/04*

U.S. Cl. 425—109 **2 Claims**



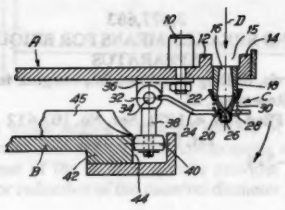
Apparatus for producing a plastic pipe or tubing having concentric juxtaposed bonded internal smooth wall tubing and external transversely corrugated wall tubing which may additionally have a further concentric more external smooth wall tubing, which apparatus comprises extrusion means for extruding at least two separate streams of thermoplastic material; means for imparting transverse corrugations to the external of these two extruded streams; and means for juxtaposing and bonding the internally extruded smooth walled tubing to the innermost surfaces of the externally disposed transversely corrugated tubing. The molding means are recirculating bipartite molds which travel in the direction of extrusion of the tubing. The internal smooth-walled tubing is juxtaposed to external tubing after such has been molded into a transversely corrugated shape.

3,677,677

DEVICE FOR THE AUTOMATIC MOLDING OF PASTE-LIKE, SOLIDIFIABLE PRODUCTS, SUCH AS, FOR INSTANCE, COSMETICS AND THE LIKE

Mario Coppola, Milan, Italy

Filed May 1, 1970, Ser. No. 33,553
Claims priority, application Italy, June 26, 1969, 18763 A/69
Int. Cl. B29c 3/02, 7/00
U.S. Cl. 425—109 13 Claims



The device comprises a rotating table for molds whereby at least part of the elements of said molds are movable to permit the removal of the molten and solidified material.

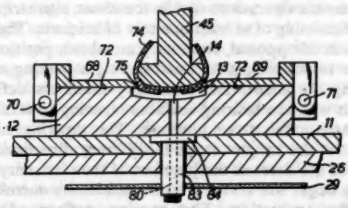
Said molds are combined with members by means of which the solidified material, after removal thereof from the mold is neatly arranged in a retaining and supporting member.

3,677,678

MOULDING MACHINE WITH PIVOTED WELT PLATES

Gerald Anthony Christie, Bath, and Brian Reginald Doble, Keynsham, both of England, assignors to G. B. Britton & Sons Limited, Bristol, England

Filed May 5, 1970, Ser. No. 34,761
Int. Cl. B29c 1/00
U.S. Cl. 425—119 7 Claims



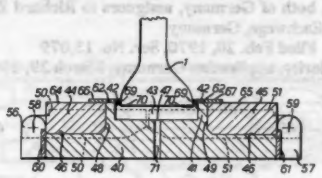
An injection moulding apparatus for forming footwear with moulded soles, of plastics materials, e.g. of polyvinylchloride or polyurethane foam, in which the injection apparatus is positioned below a support for an upwardly facing mould and is connected directly to an injection passage passing upwardly through the mould support and into the mould. A last is supported above the mould and means are provided for raising and lowering the last support and for pressing it down on to the top of the mould during the moulding operation. The injection passage is preferably positioned centrally adjacent the waist of the shoe. The mould may have movable welt plates around its periphery, which rise to allow removal of the footwear from the mould.

3,677,679

MOULDS FOR FORMING FOOTWEAR

Gerald Anthony Christie, Bath; Brian Reginald Doble, Keynsham, and Alec Roy Bromfield, Kingswood, all of England, assignors to G. B. Britton & Sons Limited, Bristol, England

Filed May 5, 1970, Ser. No. 34,760
Claims priority, application Great Britain, Nov. 5, 1969, 54,119/69
Int. Cl. B29c 1/00
U.S. Cl. 425—119 8 Claims



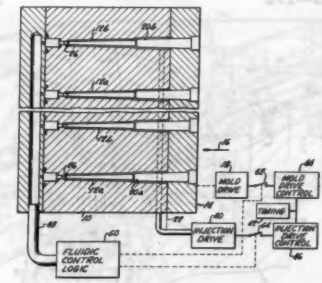
A mould assembly for for forming footwear with molded soles, e.g. by injection moulding, in which movable welt plates are mounted adjacent the sole mould, e.g. on pivots or on a parallel-motion linkage on the mould itself, and are movable between a closed position in which they define the welt surface and an open position in which they permit the moulded sole to be withdrawn from the mould. They are arranged to be automatically returned to the closed position before the commencement of each moulding operation. The automatic return to the closed position may be effected by gravity, with or without the assistance of springs or bobweights, or by cam means associated with a moving last assembly. The opening movement may be effected simply by the withdrawal of the last from the mould. A unitary mould may be used, with the welt plates mounted on light supporting blocks pivotally mounted outside the side wall of the mould.

3,677,680

FLUIDIC SENSING FOR MOLDING SYSTEM

Roger F. Etherington, Newport Beach, Calif., assignor to California Injection Molding Co., Inc., Costa Mesa, Calif.

Filed Oct. 8, 1970, Ser. No. 79,174
Int. Cl. B29f 1/00
U.S. Cl. 425—129 17 Claims



An injection molding system for forming elongated thermometer covers having a metal tip employs fluidic sensing and fluidic control logic to provide alarm signals that prevent loading of molding compound into the mold cavity when the insert in one or more of a group of mold cavities is not properly

seated and also prevent closing of the mold and insertion of an insert bearing mandrel when all inserts of a previous operation have not been withdrawn from the cavities. A vacuum drawn upon the hollow mandrels retains the insert in place upon the end of the mandrel, cools the mandrels, and cooperates with the fluid sensing devices to indicate the presence or absence of the inserts.

3,677,681

MOULD FILLING APPARATUS

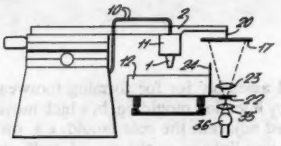
Bernd Zippel, Langenhain, and Alfred Schlieckmann, Eschwege, both of Germany, assignors to Richard Zippel & Co., KG., Eschwege, Germany

Filed Feb. 20, 1970, Ser. No. 13,079

Claims priority, application Germany, March 29, 1969, P 19 16 330.5

Int. Cl. B29f *1/04*

U.S. Cl. 425—145 **4 Claims**



Mould filling apparatus is disclosed. The apparatus comprises a nozzle for injection mould filling material, means for mounting a mould to be filled under the nozzle, displacement means for displacing the nozzle relative to the mould to be filled during a filling operation in accordance with a predetermined program dependent on the geometry of the mould to be filled. The pre-determined program for each mould to be filled is represented by a mechanical or optical pattern, which is sensed by sensing means associated with the nozzle. The sensing means is arranged to control the displacement means to cause the nozzle to follow, for example, a meandering path corresponding to the pattern sensed.

3,677,682

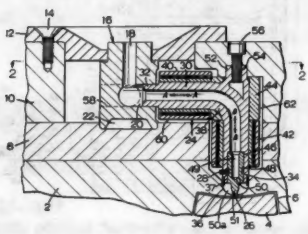
HOT RUNNER SYSTEM

Ladislao (Wladyslaw) Putkowski, 21 Limarick Ave., Weston, Ontario, Canada

Filed March 9, 1970, Ser. No. 17,846

Int. Cl. B29f *1/00*

U.S. Cl. 425—192 **31 Claims**



An L-shaped hot runner tube for plastic injection molds. The tube inlet and outlet slide snugly in bores in a sprue bushing and cavity plate respectively, so that as the runner expands and contracts, its ends can move. The tube ends can be sealed by a sleeve seal having a portion overlying the tube and of less diameter than the bore, and having a projecting portion of diameter slightly greater than that of the bore, enabling a good seal while reducing heat flow from the hot runner. Semi cylindrical heaters can be clamped to the sides of the tube and are removable without disassembling the ends of the tube.

A stem member is slidably fitted into the tube discharge end with its tip projecting into a gate in the cavity plate, to control flow. The stem member can be externally driven as a valve, or it can be biased to closed position and forced open by plastic pressure when the pressure becomes sufficiently high.

3,677,683

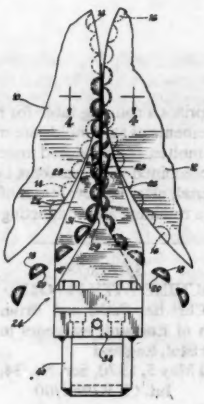
SHEAR AND BREAKER MEANS FOR BRIQUETTING APPARATUS

LeRoy S. Harris, Rolling Meadows, Ill., assignor to K-G Industries, Inc., Rosemont, Ill.

Filed Jan. 4, 1971, Ser. No. 103,612

Int. Cl. B29c *3/02*

U.S. Cl. 425—314 **9 Claims**



A shear and breaker structure for use with a briquet forming construction comprising opposed briquetting means adapted to produce a sheet consisting of at least two rows of briquets. The shear means operate to divide the sheet into strips with each strip consisting of at least one row of briquets. The shear means consist of opposed, stationary members, positioned in side-by-side relationship with each having a bearing surface for engaging the sheet. The stationary members define an open mouth with the bearing surfaces tapering towards each other to form a throat or juncture. The tapering surfaces thereby divert the briquet strips in different directions upon separation of the sheet at the juncture of the stationary members. Knife edges are formed in the stationary members to facilitate the separation. The bearing surfaces define a pronounced outwardly extending portion beyond the juncture which serves to produce longitudinal stress in the briquet strips thereby creating fracture between the individual briquets to divide the strips into individual briquet portions.

3,677,684

APPARATUS FOR ENLARGING AN EXTREMITY OF A PLASTIC PIPE

Gerald M. Platz, Champaign, Ill., assignor to National Distillers and Chemical Corporation, New York, N.Y.

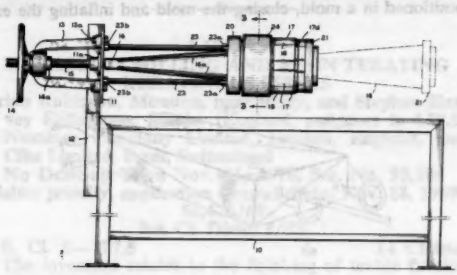
Filed Dec. 15, 1969, Ser. No. 884,901

Int. Cl. B29c *17/00*

U.S. Cl. 425—393 **6 Claims**

This invention is directed to apparatus for enlarging or belling an extremity of a plastic pipe so that the extremity of

an adjacent length of pipe may be received and retained therein. An expanding mandrel is provided, and this mandrel includes expander jaws, expander wedges, and expander



wedge guides which engage a tapered spindle. A continuous steel sheath surrounds the mandrel components and longitudinal movement of the tapered spindle provides progressive enlargement or reduction of the mandrel diameter.

3,677,685

MOLD CLAMPING MECHANISM OF INJECTION MOLDING MACHINE

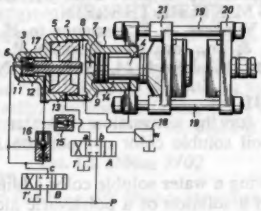
Katashi Aoki, 6037, Oaza Minamijo, Hanishina-gun, Nagano-ken, Sakaki-machi, Japan

Filed April 15, 1971, Ser. No. 134,382

Claims priority, application Japan, April 22, 1970, 45/33998

Int. Cl. B29f *1/06*; B30b *1/32*

U.S. Cl. 425—450 **5 Claims**



A mold clamping mechanism of injection molding machine in which a high pressure mold clamping cylinder, a low pressure high speed mold closing cylinder and a high pressure switching cylinder are arranged in a series relation, said mold clamping cylinder and mold closing cylinder are interconnected with each other by way of an opening to pass the pressure oil, the forward portion of a high pressure switching piston in said switching cylinder is inserted through said opening to close said opening, a mold clamping ram in said clamping cylinder is forced ahead to close the mold by advancing a high speed mold closing piston in said mold closing cylinder, and said mold clamping ram is pushed by the supply of pressure oil through a passage in said switching piston to clamp the mold tightly.

3,677,686

APPARATUS FOR ADVANCING PALLETS FOR MAKING TILES

William Sydney Powel, Leatherhead, Surrey, England, assignor to Redland Tiles Limited, Reigate, Surrey, England

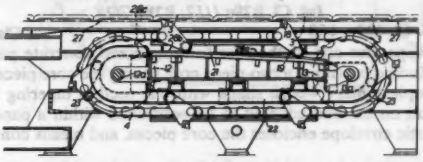
Filed June 16, 1969, Ser. No. 833,632

Claims priority, application Great Britain, Oct. 10, 1968, 48,104/68

Int. Cl. B28b *5/04*

U.S. Cl. 425—452 **7 Claims**

Apparatus for feeding relative to a molding machine a continuous stream of pallets arranged end-to-end, characterized by the provision of pallet drive means including endless conveyor means upon which are pivotally connected a series of spaced driving elements each of which includes a nose portion for engaging an appropriate rearwardly directed face on the pallets, and a follower portion adapted for engagement by stationary cam track means. The cam track means includes an inclined first portion that converges at an acute angle toward the horizontal axis of the upper run of the conveyor means, and a second portion that is generally parallel with said axis. When the follower portion of a given drive element engages



the first track portion, the drive member is pivoted from a retracted position forwardly relative to the conveyor means to drive the pallets at a speed greater than that of said conveyor means. When the follower portion engages the second track portion, the drive element travels at the speed of the conveyor means, and consequently the faster travelling pallets—which are now driven by a subsequent drive element whose follower portion is in engagement with the first track portion—progress out of engagement with the nose portion of said given drive element.

3,677,687

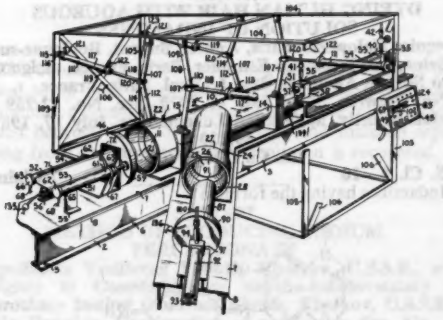
APPARATUS FOR RAM FORMING MONOLITHIC PLASTIC ARTICLES

Edward C. Siegfried; Conner J. Harwell, both of Meridian, Miss., and Shields L. Murphy, deceased, late of Meridan, Miss. (by Ransdell H. Murphy and Carolyn M. Beaner, heirs), assignors to W. S. Dickey Clay Manufacturing Company, Kansas City, Mo.

Division of Ser. No. 721,306, April 15, 1968, Pat. No. 3,557,290. This application March 23, 1970, Ser. No. 21,890

Int. Cl. B28b *21/50*

U.S. Cl. 425—457 **4 Claims**

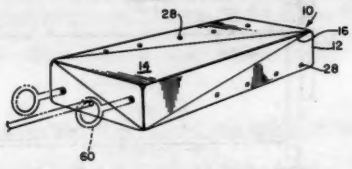


Apparatus for ram forming monolithic plastic articles, which produces articles, such as clay pipe and fittings, without

stress lines and without knit or bond lines. The apparatus includes a mold having an elongate cavity having an inside surface configuration corresponding to an outside surface of the article to be formed therein. Bore forming mandrels or rams are movable into the elongate cavity for forcing a compression formed mass of plastic clay to flow around the mandrels and fill the cavity and form the article with bores therein, the mandrels being removable from the cavity and the mold opened for removal of the article.

3,677,688
CORED SLAB WALL PANELS
Burton D. Morgan, 302 Aurora, Stow, Ohio
Filed Sept. 4, 1970, Ser. No. 69,541
Int. Cl. B29c *1/12*; B28b *7/28*
U.S. Cl. 425—468 **6 Claims**

Apparatus and method for forming cored concrete panels including providing a two-piece core having the core pieces of complementary wedge shape with one section tapering to a point on the end adapted to be positioned within a panel, a plastic envelope encloses the core pieces, and means connect to the core for inflating the envelope under pressure casting conditions. Additionally, the invention comprises pouring fresh concrete around the envelope enclosed core when it is positioned in a mold, closing the mold and inflating the envelope to force the concrete to fill the mold. After the concrete is set, the core can be removed piece by piece to provide a cored concrete panel with a plastic envelope outlining the core opening.



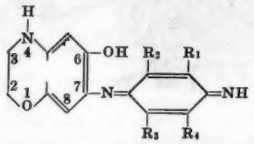
CHEMICAL

3,677,689
PROCESS FOR DYEING MANUFACTURED ARTICLES OF POLYAMIDIC RESINS
Quintino Ottaviani, Senago, Italy, assignor to Montecatini Edison S.p.A., Milan, Italy
No Drawing. Filed May 23, 1969, Ser. No. 827,140
Claims priority, application Italy, May 27, 1968, 16,956/68
Int. Cl. D06p *1/18, 1/20, 3/24*
U.S. Cl. 8—4 **6 Claims**

A process is disclosed for obtaining colorings with discontinuous or shaded color effects of the fake-tortoise type or of the marbled type on formed articles of polyamidic resins, such as spectacle frames, hair clips, bag handles, combs, etc., wherein to a slightly acidulated aqueous dyeing bath containing at least one dispersed dye, a small quantity of oil sufficient to cover at most ¾ of the free surface of the dyeing bath is added, the object of polyamidic resin being then dipped into said dyeing bath. The dyeing bath, before the object is dipped into it, may be slowly stirred so that the oil will be spread over the surface of the bath in irregular spots or patterns. The object may be slowly turned about itself in such a way that it will accomplish a complete rotation at least once every 2–3 minutes.

3,677,690
DYEING HUMAN HAIR WITH AQUEOUS SOLUTION OF INDAMINES
Gregoire Kalopissis, Paris, Andreé Bugaut, Boulogne-sur-Seine, and Françoise Estradier, Paris, France, assignors to Societe Anonyme dite: L'Oreal, Paris, France
No Drawing. Filed July 6, 1970, Ser. No. 52,739
Claims priority, application Luxembourg, July 17, 1969, 59,119
Int. Cl. D06p *3/04*
U.S. Cl. 8—10 **7 Claims**

Indamines having the formula



wherein R_1, R_2, R_3 and R_4 can be hydrogen, halogen, lower alkyl or lower alkoxy and are usefully employed in a dye composition for coloring keratinous fibers. Such compositions are aqueous solutions of the indamines and can be formulated with lower alkanols and film-forming cosmetic resins to produce hair setting lotions.

3,677,691
NONTOXIC DYES IN POLYGLYCEROL FATTY ACID ESTER AND GLYCOL OR GLYCERINE AND ITS MIXTURE THEREIN
Louis Koch, Yonkers, N.Y., assignor to H. Kohnstamm & Co., Inc., New York, N.Y.
No Drawing. Filed Sept. 24, 1968, Ser. No. 762,150
Int. Cl. D06p *3/10*
U.S. Cl. 8—41 **13 Claims**

A method for the conversion of water soluble color additives to oil soluble color compositions. The method comprises:

(a) dissolving a water soluble color additive to be converted in a solution of a polyhydric alcohol to form a first color solution;
(b) admixing this first color solution with a solution of glycerol fatty acid ester while heating the mixture to a maximum temperature of 150 C.; and
(c) maintaining the ingredients at this temperature for at least 5 minutes with constant agitation of the mixture and cooling to obtain a stable lypophilic color additive composition.

3,677,692
HIGH ENERGY RADIATION STABILIZATION OF CELLULOSE OBTAINED BY ESTERIFYING WITH FUROYL CHLORIDE
Jett C. Arthur, Jr., Metairie, La., Sujan Singh, Banaras, Uttar Pradesh, India, and Oscar Hinojosa, Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed Apr. 30, 1971, Ser. No. 139,137
Int. Cl. D06m *13/20*
U.S. Cl. 8—120 **9 Claims**

This invention relates to a method for stabilizing organic materials that contain the glycosidic bond to the effects of high energy radiation. Stabilization is achieved by the introduction of furoate groups as substituents into the said organic material. The method of this invention has as its objective the modification of the chemical structure of organic materials which contain the glycosidic bond to allow preferential transfer of high energy from one part of the organic material to the furoate substituent

group within which group radiation energy is dissipated without damage to the glycosidic bond of the organic material.

3,677,693

METHOD OF MILLING AND RESIN TREATING KERATINOUS FIBERS

Brian Robinson, Menston, near Ilkley, and Stephen Harvey Fillingham, Shipley, England, assignors to I.W.S. Nominee Company Limited, London, England, and Ciba Limited, Basel, Switzerland

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,106
Claims priority, application Great Britain, Nov. 18, 1969, 56,474/69
Int. Cl. D06m *3/02*
U.S. Cl. 8—127.5 **14 Claims**

The invention relates to the finishing of textile fabrics consisting wholly or partially of keratinous fibres such as wool. The fabric is milled and simultaneously treated with a resin imparting shrink-resistance to it by agitating it in an organic liquid containing the dissolved resin and emulsified water, separating excess liquor from the fabric and curing the resin remaining on the fabric. The resins are preferably such as will cross-link in the reactive centres on the fibres, with a co-reactant or with itself, and especially polythiol resins containing at least two thiol groups per molecule, and cross-linking catalysts may be added to the milling liquor. The process is particularly useful for knitted fabrics and garments, although it is also applicable to woven fabrics.

3,677,694

IMPARTING CREASE RESISTANCE TO FIBROUS SILK STRUCTURES THROUGH TREATMENT WITH GASEOUS FORMALDEHYDE

Yoshitaka Sugimoto and Isao Sannomiya, Hyogo-ken, and Kazunobu Noumi, Osaka, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1970, Ser. No. 88,361
Claims priority, application Japan, Nov. 10, 1969, 44/90,369; July 21, 1970, 45/63,834; July 30, 1970, 45/67,085
Int. Cl. D06m *3/02*
U.S. Cl. 8—127.6 **6 Claims**

A method of finishing silk fibrous structure which comprises treating the silk fibrous structure with a solution containing at least one compound selected from the following group: (a) urea of thiourea; (b) a mixture of formaldehyde-containing low grade condensation resin and urea or thiourea; (c) aliphatic, alicyclic or aromatic compounds having at least two hydroxyl groups and having molecular weight of no more than 400; (d) aliphatic amines having at least two groups selected from hydroxyl and amino and having molecular weight of no more than 400; drying the treated fibrous structure until the moisture content of said fibrous structure reaches no more than 10% and then, treating said fibrous structure with gaseous formaldehyde at a temperature of no less than 100° C. Durable and high crease-resistance is obtained without adversely affecting excellent properties peculiar to silk fibrous structure.

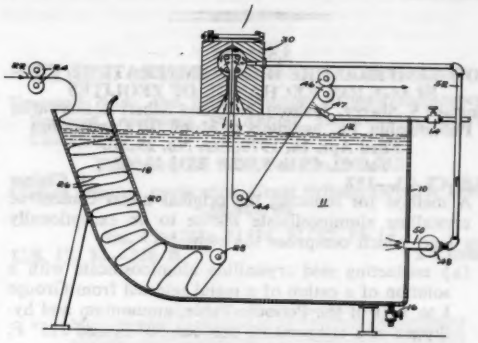
3,677,695

WET PROCESS FOR A CONTINUOUS LENGTH OF MOVING MATERIAL

Fritz Peter, 124 Howe Ave., Shrewsbury, Mass. 01545

Application June 19, 1968, Ser. No. 747,409, which is a continuation-in-part of application Ser. No. 657,632, Aug. 1, 1967. Divided and this application Apr. 23, 1970, Ser. No. 43,287
Int. Cl. B05c *3/05, 3/52, 3/176*
U.S. Cl. 8—152 **4 Claims**

A process for subjecting a continuous length of moving material to a liquid treatment. The material is initially soaked in a bath of processing liquid while in a substantially tensionless condition. Immediately thereafter, the material is guided through a treatment chamber where



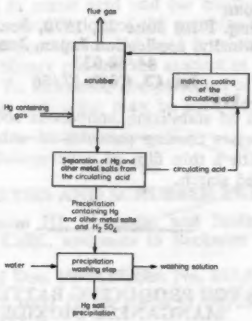
it is exposed to a high velocity flow of the same processing liquid.

3,677,696

PROCESS FOR REMOVAL AND RECOVERY OF MERCURY FROM GASES

Petri Bryk, Helsinki, Martti Haani, Kokkola, Jorma B. Honkasalo, Westend, Jorma Kinnunen and Olle Lindsjo, Pori, Erik Nyholm, Kokkola, Jaakko Poijarvi and Jussi Rastas, Pori, and Juhani Kangas, Helsinki, Finland, assignors to Outokumpu Oy, Outokumpu, Finland

Filed May 7, 1971, Ser. No. 141,239
Claims priority, application Finland, July 3, 1970, 1,901
Int. Cl. B01d *47/06*
U.S. Cl. 23—2 **2 Claims**



The concentration of circulating sulphuric acid is adjusted to 80–98% by weight and used to wash hot gases containing mercury. The temperature of the acid is maintained between 70–250° C. and the solid material separating from the circulating wash solution is recovered.

3,677,697

METHOD OF PRODUCING SODIUM PERCARBONATE

Appolinaria Vasilievna Yanush, Kharkov, U.S.S.R., assignor to Gosudarstvenny naucho-issledovatelsky i proektny Institut Osnovnoi Khimii, Kharkov, U.S.S.R.

No Drawing. Continuation of application Ser. No. 736,595, June 13, 1968. This application Oct. 7, 1970, Ser. No. 78,957
Int. Cl. C01b *15/10*
U.S. Cl. 23—62 **3 Claims**

A method of producing sodium percarbonate by reacting sodium carbonate with hydrogen peroxide in the pres-

ence of a stabilizer wherein sodium percarbonate stabilization is effected by using benzoic acid in combination with a known stabilizing agent, e.g. a silica-containing inorganic compound.

3,677,698
LOW TEMPERATURE-HIGH TEMPERATURE TWO-STAGE ION EXCHANGE OF ZEOLITES
Howard S. Sherry, Trenton, N.J., and Albert B. Schwartz, Philadelphia, Pa., assignors to Mobil Oil Corporation
Filed Apr. 16, 1970, Ser. No. 29,210
Int. Cl. C01b *33/28*; B01j *11/40*
U.S. Cl. 23—112 **8 Claims**

A method for reducing the original metal content of a crystalline aluminosilicate zeolite to an exceptionally low level which comprises the steps of:

(a) contacting said crystalline aluminosilicate with a solution of a cation of a metal selected from Groups I to VIII of the Periodic Table, ammonium and hydrogen at a temperature between 50° F. and 215° F. under atmospheric pressure;
(b) contacting said crystalline aluminosilicate with a solution of a metal of Groups I to VIII of the Periodic Table at a temperature between 300° F. and 600° F. under sufficient pressure to maintain the solution in the liquid phase; and
(c) withdrawing a cation exchanged zeolite having at least 80 percent of its initial cations exchanged with the cations of said solutions.

3,677,699
METHOD OF STABILIZING ANHYDROUS SODIUM DITHIONITE
Ryozo Fujiwara, Eiji Ohara, and Kazuo Maeda, Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan
No Drawing. Filed June 22, 1970, Ser. No. 48,447
Claims priority, application Japan, June 26, 1969, 44/50,033
Int. Cl. C01b *17/66*
U.S. Cl. 23—116 **10 Claims**

A method of stabilizing anhydrous sodium dithionite which comprises coating particles of anhydrous sodium dithionite with a thin film of oxypropylated cellulose or oxypropylated starch.

3,677,700
PROCESS FOR PRODUCING BATTERY-GRADE MANGANESE DIOXIDE
Alan R. Fraser, Michigan City, Ind., assignor to Gray-Tim, Inc., Gary, Ind.
No Drawing. Filed Sept. 29, 1970, Ser. No. 76,613
Int. Cl. C01g *45/02*
U.S. Cl. 23—145 **11 Claims**

Battery grade manganese dioxide is prepared from impure manganese dioxide containing iron oxide, alumina, silica, lime, and other contaminants by roasting the impure feed under reducing conditions to form manganous oxide and magnetic iron oxide, thereafter slowly acidifying the roasted material with nitric acid to convert the manganous oxide to manganous nitrate and then adjusting the pH to a higher value to precipitate hydrated alumina. The resulting extracted solution is separated from the precipitate, concentrated to about 55–70% solid, heated as an agitated compact mass to decompose the manganous nitrate to manganese dioxide without decomposing the alkali nitrates, and water extracting soluble nitrates from the heated concentrate, leaving a purified manganese dioxide. This may, where desired, be further purified to produce a battery grade manganese dioxide product.

3,677,701
SULFURIC ACID DEFLUORINATION
Clinton A. Hollingsworth, 2010 Reaney Road; and John Harold Snyder, 546 Carole St., both of Lakeland, Fla. 33803; and Ernest Andrew Gudath, 413 S. Bryan Circle, Brandon, Fla. 33511
No Drawing. Filed June 1, 1970, Ser. No. 41,648
Int. Cl. C01b *17/90, 9/08*
U.S. Cl. 23—172 **9 Claims**

Concentration of fluorine compounds in spent sulfuric acid can be reduced by at least 96% by mixing the acid with diatomaceous earth in excess of the stoichiometric amount.

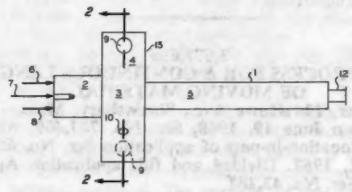
3,677,702
NITROGEN FIXATION
Leroy H. Wullstein, Salt Lake City, Utah, assignor to University of Utah
No Drawing. Filed July 30, 1969, Ser. No. 846,278
Int. Cl. C01c *1/00, 21/00*
U.S. Cl. 23—193 **10 Claims**

A method of nitrogen fixation by purely chemical means rather than biochemical means, wherein a gaseous phase comprising molecular nitrogen is contacted with an aqueous system comprising ferrous iron and a nitrite to form ammonium radical (NH_4) and molecular nitrogen. The reaction takes place either at room temperature and pressure, or at greater temperatures and pressures, and can utilize air as the source of gaseous nitrogen.

3,677,703
METHOD OF PURIFYING HYDRATES OF CALCINED DOLOMITE AND MAGNESITE
Leonard John Minnick, Cheltenham, Pa., assignor to G. & W. H. Corson Inc., Plymouth Meeting, Pa.
Filed July 14, 1970, Ser. No. 54,686
Int. Cl. C08f *11/02*
U.S. Cl. 23—186 **5 Claims**

Dry, dihydrated calcined dolomite or dry hydrated calcined magnesite, having a particle size distribution such that at least the major portion and up to about 95% thereof, is −325 mesh and the remainder is larger than 325 mesh, is dispersed into an upwardly moving stream of air, in a confined zone, adapted in conjunction with centrifugal force acting primarily on the larger particles selectively to carry a fine fraction of the hydrate upwardly and outwardly to a zone separate and distinct from that to which the remainder is directed, and the fine fraction, which has a lower silica content than that of the original hydrate is separately recovered.

3,677,704
PRODUCTION OF CARBON BLACK
John W. Byron, Toledo, Ohio, assignor to Phillips Petroleum Company
Original application Feb. 6, 1969, Ser. No. 797,212. Divided and this application June 3, 1971, Ser. No. 149,564
Int. Cl. C09c *1/50*
U.S. Cl. 23—209.4 **3 Claims**



Grit is removed from the gaseous mass in a carbon black furnace by passing the gaseous mass over a radial

port or depression in the wall of the lower periphery of the furnace thereby entrapping the grit which is removed by means of a draw-off conduit.

3,677,705

PROCESS FOR THE CARBONIZATION OF A STABILIZED ACRYLIC FIBROUS MATERIAL

Michael J. Ram, West Orange, and John P. Riggs, Berkley Heights, N.J., and Charles M. Clarke, Texas City, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 9, 1970, Ser. No. 17,780

Int. Cl. C01b *31/07*

U.S. Cl. 23—209.1 **24 Claims**

A process is provided for the rapid conversion of a continuous length of an inherently hygroscopic stabilized acrylonitrile homopolymer or copolymer to a carbonized form exhibiting improved physical properties. The stabilized starting material is supplied in an essentially anhydrous form immediately prior to its passage through a heating zone containing an inert atmosphere in which its temperature is relatively rapidly elevated to produce a carbonized fibrous material. The resulting continuous length of carbonized fibrous material may be subsequently converted to a continuous length of fibrous graphitic carbon possessing superior properties.

3,677,706

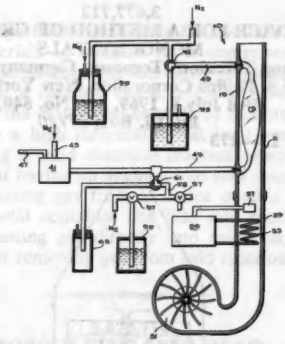
REACTOR

Jack Graff, Santa Clara, and Ralph A. Dora, Santa Barbara, Calif., assignors to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed Feb. 24, 1970, Ser. No. 13,663

Int. Cl. B01l *3/00*; G01n *31/00*

U.S. Cl. 23—230 R **10 Claims**



A reactor for carrying out laboratory scale chemical reactions in the liquid phase comprises a vertically elongated vessel of circular cross-section having steep side walls gradually widening from the top and the bottom, and openings at the top and bottom. An exterior heater is used to regulate the liquid temperature. A passageway for supplying fluid to the lower opening has a portion of restricted sides whereby the constant introduction of gas at low pressure to the passageway prevents liquid outflow while the valveless passageway remains physically open to permit the sequential injection of reagents. A similar passageway for the upper opening permits droplets of solvent to be introduced at the conclusion of reaction; these wash the interior surface of the reactor to afford quantitative recovery of the reaction product.

3,677,707

METHOD OF DETERMINING HAEMOGLOBIN

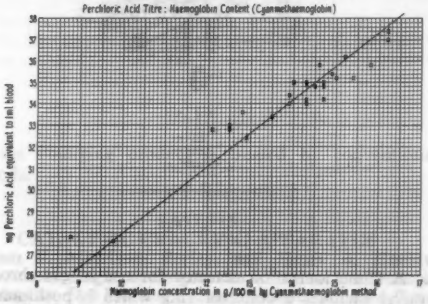
Emanuel Pride and Brian Warren, Minster-in-Sheppey, England, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 27, 1969, Ser. No. 869,713

Claims priority, application Great Britain, Oct. 28, 1968, 50,946/68

Int. Cl. G01n *21/24, 31/22, 33/16*

U.S. Cl. 23—230 B **2 Claims**


Perchloric Acid Titre: Haemoglobin Content (Cyanmethaemoglobin)
mg Perchloric Acid equivalent to 1ml blood
Haemoglobin concentration in g/100 ml by Cyanmethaemoglobin method

Method for the determination of the haemoglobin content in blood. A blood sample is mixed with a solution of perchoric acid in acetic acid and the mixture is checked for complete neutralization of the perchloric acid added. The amount of perchloric acid used is selected in such a way that an arbitrary pre-selected amount of haemoglobin is neutralized. To determine completeness of the neutralization, a colour indication may be used advantageously.

3,677,708

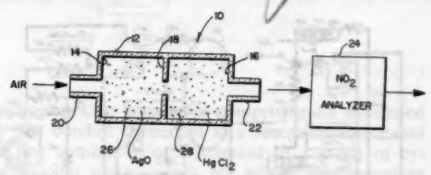
NO_2 ANALYSIS AND SCRUBBER THEREFOR

John N. Harman III, Placentia, and Radhakrishna M. Neti, Brea, Calif., assignors to Beckman Instruments, Inc.

Filed Dec. 15, 1969, Ser. No. 885,006

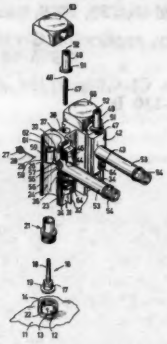
Int. Cl. B01j *11/06*; G01n *31/06, 31/10*

U.S. Cl. 23—232 R **7 Claims**



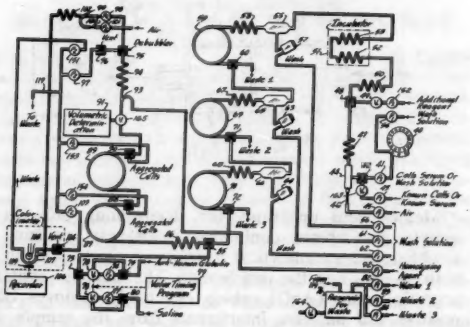
Method and apparatus for determining NO_2 in a sample gas stream containing interferents utilizing a scrubber and an analytical instrument which is sensitive both to NO_2 and the interferents. The scrubber contains argentic oxide (AgO) which effectively removes both positive and negative interferents from the sample gas stream, but does not affect the NO_2 content of the stream. The invention is particularly applicable to the monitoring of the NO_2 content of polluted air.

3,677,709
FLAME IONIZATION DETECTION APPARATUS AND METHOD
Manfred Riedmann, Boblingen, and Martin Eichner, Aidlingen, Wurttemberg, Germany, assignors to Hewlett-Packard G.m.b.H., Boblingen, Germany
Filed July 2, 1970, Ser. No. 51,749
Claims priority, application Germany, July 14, 1969, P 19 35 624.2
Int. Cl. G01n *31/12*
U.S. Cl. 23—254 E 10 Claims



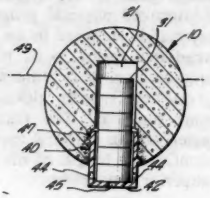
A flame ionization detector for use in gas chromatography includes a collector ring which is positionally adjustable with respect to a flame nozzle. The collector ring supports one or more pieces of salt in an interchangeable manner, each salt being operable to amplify ionic current in a different substance. Pesticide components such as phosphorus and nitrogen are distinguished from hydrocarbons and chlorinated substances by the differences in magnitude and polarity of the corresponding peaks obtained on a chromatogram. This is achieved by optimizing the collector ionic current and gradually increasing the quantity of combustible gas supplied to the detector.

3,677,710
APPARATUS FOR WASHING BLOOD CELLS
Nathan M. Hirsch, Wallington, N.J.
(33 Pond Ave., B–820, Brookline, Mass. 02146)
Filed June 2, 1969, Ser. No. 829,385
Int. Cl. A61m *1/03*
U.S. Cl. 23—258.5 5 Claims



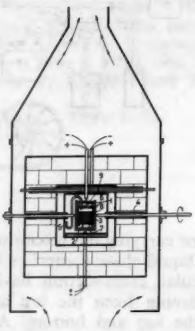
A method and apparatus for automatically performing the Coombs anti-human globulin test in a continuous flow system. Central to both the method and the apparatus is a new cell washing technique which permits continuous washing of the cells that are to be reacted with the Coombs serum. This technique involves gravitational settling and separation of aggregated cells from a supernatant material. The gravitational separation step is also used to separate the agglutinated cells from the dissociated cells after a Coombs reaction has taken place.

3,677,711
PLURAL CAVITY TOROIDAL FLOAT POOL CHEMICAL PACKAGE
William D. Bond, Arcadia, Calif., assignor to World Industries, Inc., Azusa, Calif.
Filed Mar. 25, 1970, Ser. No. 22,556
Int. Cl. B01f *1/00*
U.S. Cl. 23—267 A 2 Claims



A float ring contains cavities each filled with a soluble pool chemical such as chlorine tablets or granules. A tube cap protrudes an adjustable amount from each cavity of the float ring and an aperture of each tube is in the protruded portion. Each tube cap is adjustable in its float ring cavity to change the area of the tube cap aperture effectively open to pool water so as to alter the rate at which the chemical dissolves into the pool.

3,677,712
DEVICE FOR A METHOD OF GROWING MONOCRYSTALS
Wolfgang Tolksdorf, Tornesch, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed July 9, 1969, Ser. No. 840,331
Int. Cl. B01j *17/20*
U.S. Cl. 23—273 2 Claims



A device for growing monocrystals from a melt in which the melt is contained in a closed vessel rotatable

within an oven, the vessel being provided with an S-shaped deaeration tube which extends into the vessel through its upper end and has an effective length for removing gases from the melt without withdrawing melt when the vessel is rotated.

3,677,713

FURNACE FOR THE MANUFACTURE OF CERAMIC WHISKERS

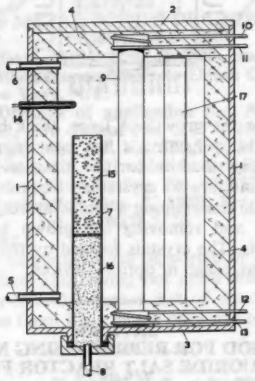
Christopher Charles Evans, Saffron Walden, England, assignor to the Secretary of State for Defence in the Government of the United Kingdom

Continuation of application Ser. No. 729,081, May 14, 1968, which is a continuation-in-part of application Ser. No. 406,127, Oct. 23, 1964, now Patent No. 3,394,991, dated July 30, 1968. This application Nov. 27, 1970, Ser. No. 93,428

Claims priority, application Great Britain, Oct. 28, 1963, 42,439/63

Int. Cl. B01j *17/28*

U.S. Cl. 23—277 R **11 Claims**



A furnace particularly suitable for the manufacture of ceramic materials in whisker form comprises a hollow casing lined internally with thermally insulating material and enclosing a reaction space, a carbon electrode disposed within the casing and capable of heating said reaction space to a high temperature, at least one container for containing a solid chemical reactant provided within the casing and having an opening into said reaction space, means for passing gas from a source outside the casing through the said container and into said reaction space, means for passing gas directly into said reaction space and means for removing gas from said reaction space.

3,677,714

POROUS RING FEED HEAD

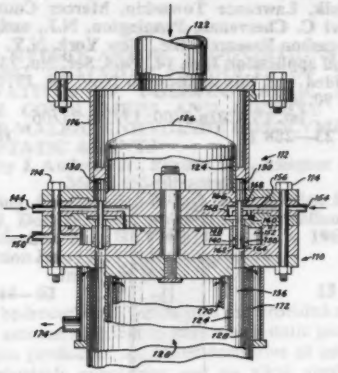
Lowell Ashton Ledgett, Ridgewood, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of abandoned application Ser. No. 766,255, Oct. 9, 1968. This application Mar. 17, 1971, Ser. No. 125,416

Int. Cl. B01f *3/02*; B01d *47/00*; C07f *141/00*

U.S. Cl. 23—285 **6 Claims**

A reactor for continuously sulfonating or sulfating organic compounds with sulfur trioxide wherein the organic compound is fed through a porous wall having a moderate pressure drop thereacross. The organic compound is then directed to flow in a circumferentially uniform thin film down the inner cylindrical wall or walls of a cooled reaction zone. Low pressure sulfur trioxide contacts the organic compound on the inner surface of the cooled walls and forms a thin film of reaction mixture,



and the emerging product is treated by conventional methods.

3,677,715

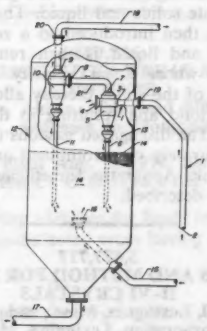
CATALYTIC CRACKING APPARATUS

William F. Morrison, Purley, and Henry A. Hauser, Sevenoaks, England, assignors to Universal Oil Products Company, Des Plaines, Ill., and Ambuco Limited, London, England, fractional part interest to each

Filed Apr. 13, 1970, Ser. No. 27,944

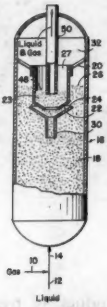
Int. Cl. B01d *45/12*; B01j *9/20*; C10g *13/18*

U.S. Cl. 23—288 S **2 Claims**



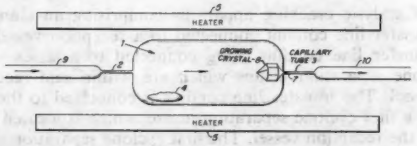
Catalytic cracking apparatus comprising an elongated transfer line conduit connected to a reception vessel said transfer line conduit being connected to a series of cyclone separation means which are within said reception vessel. The transfer line conduit is connected to the inlet of a first cyclone separation means which is located within the reception vessel. The first cyclone separation means contains an inlet which is in communication with the internal portion of said reception vessel. The first cyclone separation means is connected to a second cyclone separation means which accepts material from the outlet of said first cyclone separation means and passes a portion of those materials out of the second cyclone separation means through an outlet which passes out of the reception vessel.

3,677,716
PHASE SEPARATION OF A GAS-LIQUID-SOLID MIXTURE
Carl L. Weber, Washington Crossing, Pa., and Ronald H. Wolk, Lawrence Township, Mercer County, and Michael C. Chervenak, Pennington, N.J., assignors to Hydrocarbon Research, Inc., New York, N.Y.
Original application June 14, 1968, Ser. No. 737,156. Divided and this application Nov. 18, 1970, Ser. No. 90,761
Int. Cl. C01g *1/00, 13/18, 23/06*
U.S. Cl. 23—288 E **16 Claims**



Apparatus for improved separation of liquids, gases and particulate solid materials in a liquid-gas contacting process wherein a liquid feed and gas usually hydrogen are passed upwardly through a bed composed of a particulate contact agent, the velocity of the gas and the liquid being such that the particles are put in a state of random motion and the volume of the bed is expanded over its static volume and wherein an area of high liquid gas and liquid turbulence and mixing is created and wherein liquid effluent and gaseous effluents are removed from the contact zone. The method consists of effecting essentially complete disengagement of the gas from the mixture of particulate solids and liquid. The gas-free liquid-solid mixture is then introduced to a zone of relatively low turbulence and liquid is then removed from this zone at a rate whose linear velocity is less than the settling velocity of the solid, thereby allowing substantial settling of the solid and resulting in the removal of a clarified liquid. The disengaged gaseous effluent may then be removed separately or recombined and removed with the liquid effluent. Apparatus for efficiently carrying out this process are described.

3,677,717
APPARATUS AND METHOD FOR PRODUCING II–VI CRYSTALS
Paul Vohl, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.
Filed Mar. 6, 1969, Ser. No. 804,895
Int. Cl. B01j *17/30*
U.S. Cl. 23—294 **13 Claims**

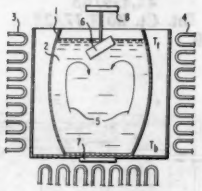


Apparatus is disclosed for nucleating and growing II–VI crystals such as zinc selenide. The apparatus comprises a hollow reaction vessel having walls constructed of an inert, high-temperature resistant material and having an outlet passageway with a much smaller cross-sectional area than that of the reaction vessel, the reduction in area occurring immediately adjacent to the point of crystal nucleation. This apparatus also contains a means for heating the reaction vessel to temperatures of at least about 400° C.

A process for nucleating and growing II–VI crystals using a throttling technique is also disclosed.

The apparatus and process disclosed are useful for producing single, pure, defect-free II–VI crystals which are in turn useful in electro-optic applications.

3,677,718
TECHNIQUE FOR FLUX GROWTH OF BARIUM TITANATE SINGLE CRYSTALS
William N. Lawless, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed May 5, 1969, Ser. No. 821,907
Int. Cl. C01f *11/00;* **B01j** *17/04*
U.S. Cl. 23—301 R **8 Claims**



Process for the growth of large, thick barium titanate single crystals by heating a flux containing barium titanate, inserting therein barium titanate seed crystals, cooling the mixture to crystallize barium titanate single crystals, while maintaining a temperature gradient across the mixture and removing the grown barium titanate single crystals. The crystals formed by the above process find particular usage in optical devices.

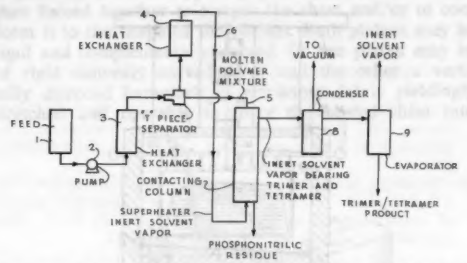
3,677,719
METHOD FOR REPROCESSING MOLTEN FLUORIDE SALT REACTOR FUELS
Marvin E. Whatley, Oak Ridge, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission
Filed Mar. 9, 1971, Ser. No. 122,402
Int. Cl. C22b *61/04*
U.S. Cl. 23—325 **4 Claims**

An improved method for reprocessing molten fluoride salt reactor fuels containing protactinium is provided comprising a dual temperature reductive extraction process using as an extractant molten bismuth containing a metal reductant. In the improved process the fuel values and the metal reductant are the only extractables.

3,677,720
PURIFICATION OF PHOSPHONITRILIC CHLORIDE POLYMERS
John Keith Maund, Birmingham, and Clifford Henry George Hands, Stourbridge, England, assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.
Filed Mar. 14, 1969, Ser. No. 807,197
Int. Cl. C01b *21/00, 25/00*
U.S. Cl. 23—357 **16 Claims**

A mixture of phosphonitrilic chloride polymers is purified by contacting a molten phosphonitrilic chloride mixture with an inert solvent vapor so as to selectively vaporize the cyclic trimeric polymer, separating a solvent vapor phase laden with trimer and some tetramer from the molten polymer residue, condensing it to form a solution of trimer and tetramer in the solvent, and subsequently recovering trimer together with some tetramer from the solution. During the process the molten phosphonitrilic chloride mixture is preferably maintained at a temperature below 140 degrees centigrade. The phosphonitrilic

chloride polymer feed stock can be pretreated by dissolving it in an inert solvent, followed by heating the resulting solution under reflux in the presence of an absorbent medium, and subsequently cooling the solution and filtering it free from absorbent medium. The process provides a very efficient and economic method for the recovery and purification of phosphonitrilic chloride trimer.



3,677,721

POROUS METAL BODIES OF UNIFORM POROSITY

Raymond J. Elbert, Middleburg Heights, and Ernest G. Farrier, Parma, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Division of application Ser. No. 798,142, Feb. 10, 1969, now Patent No. 3,577,226, which is a division of application Ser. No. 650,250, June 30, 1967, now Patent No. 3,433,632, which in turn is a continuation-in-part of application Ser. No. 484,123, Aug. 31, 1965. This application Dec. 7, 1970, Ser. No. 95,976

Int. Cl. B22f *3/10*

U.S. Cl. 29—182.2 **8 Claims**

Sintered porous metal sheets supported or unsupported by a backing sheet and having not more than about one pore per twenty-five (25) square feet of sheet with a size larger than three times the average pore size of said sheet.

3,677,722

CEMENTED CARBIDE COMPOSITION AND METHOD OF PREPARATION

Frank Rymas, Sterling Township, Macomb County, Mich., assignor to The Walmet Corporation, Pleasant Ridge, Mich.

No Drawing. Continuation-in-part of application Ser. No. 738,401, June 20, 1968. This application Nov. 24, 1969, Ser. No. 879,603

Int. Cl. C22c *11/29*

U.S. Cl. 29—182.8 **11 Claims**

This invention relates generally to improved cemented carbide compositions and more particularly to modified tungsten carbide-cobalt compositions which in a single cemented alloy possess improved strength and hardness characteristics that make them particularly useful in applications requiring resistance to wear and impact. This invention also concerns the method of making the improved compositions of this invention.

3,677,723

COMPOSITE MATERIAL OF VANADIUM ALLOYS AND IRON OR NICKEL ALLOYS

Hans-Ulrich Borgstedt, Karlsruhe-Waldstadt, Manfred Ruhle, Frankfurt am Main, and Peter Wincierz, Oberursel, Taunus, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

No Drawing. Filed Mar. 11, 1969, Ser. No. 806,317

Claims priority, application Germany, Mar. 16, 1968, P 16 08 157.5

Int. Cl. B32b *15/00*

U.S. Cl. 29—194 **7 Claims**

A composite material for cladding nuclear fuel elements is composed of vanadium alloy base material joined to a metallic outer material composed of iron or nickel and being resistant to corrosion by reactor coolants.

3,677,724

LIQUID HYDROCARBON COMPOSITIONS CONTAINING REACTION PRODUCTS OF AMINE DERIVATIVES OF 1-OLEFIN/MALEIC ANHYDRIDE COPOLYMERS AND METHYL VINYL ETHER-MALEIC ANHYDRIDE COPOLYMERS AS ANTI-STATIC AGENTS

Harry J. Andress, Jr., Pitman, N.J., assignor to Mobil Oil Corporation

No Drawing. Continuation-in-part of application Ser. No. 885,268, Dec. 15, 1969, which is a continuation-in-part of application Ser. No. 797,701, Feb. 7, 1969. This application Jan. 19, 1970, Ser. No. 4,024

Int. Cl. C10l *1/18, 1/22*

U.S. Cl. 44—62 **13 Claims**

Liquid hydrocarbon compositions are provided containing, in an amount sufficient to impart anti-static properties, the reaction product of an amine derivative of an olefin/maleic anhydride copolymer and an alkyl vinyl ether-maleic anhydride copolymer.

3,677,725

LIQUID HYDROCARBON COMPOSITIONS CONTAINING ANTISTATIC AGENTS

Harry J. Andress, Jr., Pitman, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Feb. 4, 1970, Ser. No. 8,702

Int. Cl. C10l *1/18, 1/22*

U.S. Cl. 44—62 **6 Claims**

Compositions are provided containing, in an amount sufficient to impart antistatic properties, copolymers of maleic anhydride and a 1-olefin or an alkylvinylether or their alkyl esters, carboxymethyl esters or carboxymethyl amides.

3,677,726

MONOSUBSTITUTED UREAS AS FUEL ADDITIVES

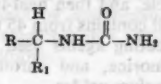
Aubert Y. Coran, Akron, Ohio, and Billy D. Vineyard, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Aug. 3, 1970, Ser. No. 60,639

Int. Cl. C10l *1/18, 1/22*

U.S. Cl. 44—71 **8 Claims**

Varnish-removing additives for liquid hydrocarbon fuels comprising monosubstituted ureas having the formula



where R is hydrogen, alkyl or alkenyl and R_1 is alkyl or alkenyl, and the sum of the carbon atoms in R and R_1 is from about 5 to about 25.

3,677,727

PROCESS OF ACTIVATION AND GASIFICATION OF FLUIDISED CARBONACEOUS MATERIALS

Albert Godel, Paris, France, assignor to Societe Anonyme Activit, Paris, France

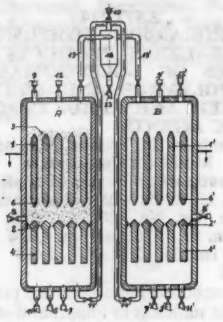
Filed Aug. 14, 1970, Ser. No. 63,845

Int. Cl. C10j *3/00, 3/04*

U.S. Cl. 48—206 **7 Claims**

A process for activation and gasification of granulated carbonaceous material by an activating gas, at high temperature, wherein the reaction is operated in fluidised bed

within a reactor and in contact with fixed hot refractory masses capable of accumulating sufficient calories to compensate the heat losses, from the reacting medium, due



to the endothermicity of the chemical activation-gasification reaction, these fixed refractory masses contained in a reactor being subjected to cyclic reheating before each activation-gasification phase.

3,677,728

METHOD OF MANUFACTURING CRYSTALLINE-GLASS ARTICLES

Isaak Iljich Kitaigorodsky, deceased, late of Moscow, U.S.S.R., by Evgenya Antonovna Kitaigorodskaya, administrator, Petrovsky buljvar 4/6, Apt. 4, Moscow, U.S.S.R.

No Drawing. Continuation-in-part of application Ser. No. 816,139, Feb. 27, 1969, which is a continuation of application Ser. No. 644,762, June 6, 1967, which in turn is a continuation-in-part of application Ser. No. 302,456, Aug. 15, 1963. This application Mar. 23, 1970, Ser. No. 22,051

Int. Cl. C03c *3/22*

U.S. Cl. 65—19 **4 Claims**

In a method for manufacturing crystalline-glass articles non-metallic additives containing SiO_2 are dissolved together with a selected nucleating agent in a molten slag obtained directly from a metallurgical furnace. The glass melt is then homogenized, clarified, molded into the shape of the desired article, and then heat-treated to crystallize the article. The melt contains from 45 to 75 weight percent of slag. The nucleating agents used are iron and manganese sulfides, fluorine, and chromium, phosphorous, magnesium and titanium oxides.

3,677,729

CHEMICAL TEMPERING PROCESS FOR GLASS BY SPRAYING

Emile Plumat, Gilly, Belgium, assignor to Glaverbel S.A., Watermael-Boitsfort, Belgium

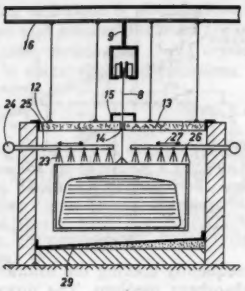
Filed Sept. 9, 1969, Ser. No. 856,299

Claims priority, application Luxembourg, Sept. 12, 1968, 56,873

Int. Cl. C03c *21/00*

U.S. Cl. 65—30 **17 Claims**

A process and apparatus for chemically tempering a body of a material amendable to such treatment by disposing the body in a non-liquid environment, and projecting against the body a continuous supply of a liquid tempering medium at a flow rate sufficient to cause a continuous stream of the medium to flow across the surfaces to be tempered.



3,677,730

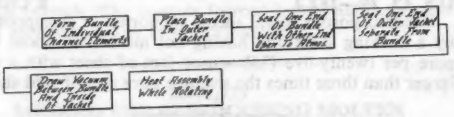
METHOD OF FABRICATING AN ARRAY OF CHANNEL MULTIPLIERS

Bagdasar Deradoorian, Detroit, and George W. Goodrich, Bloomfield Hills, Mich., and Dimitri G. Theodorou, Chicago, Ill., assignors to The Bendix Corporation

Filed Dec. 18, 1968, Ser. No. 784,855

Int. Cl. C03c *27/06*

U.S. Cl. 65—36 **2 Claims**


Form Bundle Of Individual Channel Elements
Place Bundle In Outer Jacket
Seal One End Of Bundle With Other End Open To Atmos.
Seal Opp. End Of Outer Jacket Separate From Bundle
Draw Vacuum Between Bundle And Inside Of Jacket
Heat Assembly While Rotating

A method of forming an array from a bundle of individual channel multipliers, the individual channels being fabricated of a lower temperature softening glass tube to permit the walls of the individual channels to be spiralled and also expanded to fill the interstices within a higher softening temperature outer tube. Also, the invention could be practiced utilizing glass tubes of the same temperature softening charatceristic. The expanding and spiralling operation is performed simultaneously by drawing the bundle of individual channels through a furnace while rotating the feed or pull assemblies of the drawing apparatus to spiral the channel bundle and exhausting the area between the individual tubes and the equal or higher temperature softening glass tube to expand the individual channels.

3,677,731

METHOD FOR VERTICAL SUSPENSION OF GLASS SHEETS DURING THERMAL TREATMENT

Michel Martin, Soisy-sous-Montmorency, France, assignor to Compagnie de Saint Gobain, Neuilly-sur-Seine, France

Filed Mar. 24, 1969, Ser. No. 827,436

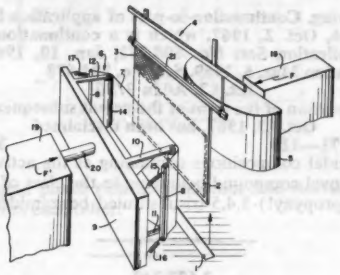
Claims priority, application France, Mar. 26, 1968, 145,470

Int. Cl. C03b *21/00*

U.S. Cl. 65—102 **16 Claims**

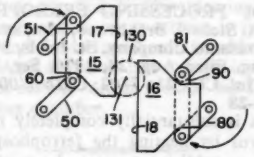
Method of, and article produced by suspending a sheet or lamina of glass vertically, by placing the sheet within a flat sack of refractory fabric, suspending the sheet by supporting the sack at or along its upper edge while

heating it to a desired or softening temperature. After heating, the sheet suspended by its sack is transported to a position between opposing press platens, which are then forced together to temper the sheet and/or to conform it to the shape of the platens. Both platens may be rigid and complementally curved. Or one platen may be of rigid convexly curved form and the other a vertically disposed hammock of refractory fabric yieldingly stretched and operable to force the heated sheet into



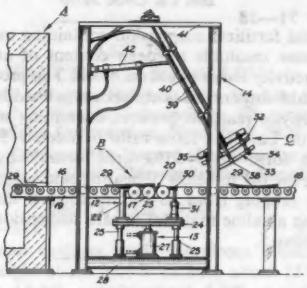
conformity with the rigid platen. The invention is of particularly utility in the production of laminated glass sheets as for automobile windshields, wherein the rigid platen may be a first lamina previously shaped and tempered, and the second untempered lamina, originally flat, heated and suspended within its sack, is pressed against the rigid platen and is shaped thereby, then removed from the sack and adhesively secured to the first lamina, to complete the laminated sheet.

3,677,732
MOLTEN GLASS SHEARS
John R. Dorman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Feb. 1, 1971, Ser. No. 111,327
Int. Cl. C03b 5/38
U.S. Cl. 65—133 **25 Claims**



Molten glass shears for separating, cutting or severing gobs or mold charges of molten glass from a stream thereof issuing from an outlet orifice of a glass tank, feeder, forehearth or other type of container. The shears comprise first and second blades preferably having straight or linear cutting edges which are disposed on opposite sides of the molten glass stream preferably at right angles to the longitudinal axis thereof, and are preferably so disposed with the cutting edges in a facing and parallel coplanar relationship or orientation with each other. The output shaft of a motor means is coupled with the shear blades to move the cutting edges through curved paths of movement, and into and out of at least near wiping or sliding contact with each other while imparting a slicing motion to each cutting edge during continued maintenance of said preferred relationship therebetween. The slicing motions of the cutting edges are preferably, but need not necessarily be, in directions opposite to each other during each respective glass severance operation, and the slicing motions of each respective blade are preferably, but need not necessarily be, in opposite directions during alternate succeeding ones of a succession of glass severance or shearing operations.

3,677,733
GLASS SHEET BENDING AND TEMPERING APPARATUS
George F. Ritter, Jr., Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio
Filed Sept. 5, 1969, Ser. No. 855,559
Int. Cl. C03b 23/02
U.S. Cl. 65—268 **3 Claims**



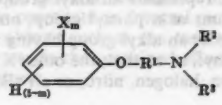
A bending and tampering apparatus particularly adapted for treating thin glass sheets. The bending apparatus is of the inertia-gravity type and utilizes a cantilever mounted shaping rail. Upper and lower cooling blastheads are swung over the unsupported end of the shaping rail to apply tempering air immediately after bending, before excessive heat is lost by the thin glass.

3,677,734
PRODUCTION OF FERTILIZER FROM WET PHOSPHORIC ACID
Robert L. Carroll and Charles R. Hayward, Richmond, Va., assignors to Swift Agricultural Chemicals Corporation, Chicago, Ill.
Filed Aug. 25, 1969, Ser. No. 852,632
Int. Cl. C05b 7/00; C01b 25/28
U.S. Cl. 71—34 **6 Claims**

Ammonium polyphosphates having a major portion of the P_2O_5 content thereof in the form of condensed phosphates, are prepared by ammoniating wet-process phosphoric acid with ammonia in a multi-stage operation under specified conditions.

3,677,735
METHOD FOR THE CONTROL OF AQUATIC PLANT LIFE
Sidney B. Richter, Chicago, and Alfred A. Levin, Skokie, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.
No Drawing. Filed Aug. 20, 1969, Ser. No. 851,728
Int. Cl. A01n 9/00
U.S. Cl. 71—66 **8 Claims**

This invention discloses a method for the control of aquatic plant life which comprises contacting said plant life with a phytotoxic amount of a composition which comprises a compound of the formula



wherein R^1 is an alkylene group of from 2 to 4 carbon atoms; R^2 and R^3 are independently selected from the group consisting of hydrogen, alkyl and alkenyl; X is selected from the group consistingof alkyl, alkenyl, alkoxy, halogen, nitro and dialkylamino; and *m* is an integer from 0 to 5.

3,677,736
LIQUID FERTILIZER SUSPENSION CONTAINING UREAFORM
Richard E. Formaini, Hopewell, Va., assignor to Allied Chemical Corporation, New York, N.Y.
No Drawing. Continuation of application Ser. No. 56,689, July 20, 1970, which is a continuation-in-part of application Ser. No. 827,033, May 22, 1969, which in turn is a continuation of application Ser. No. 643,845, June 6, 1967. This application June 8, 1971, Ser. No. 150,931
Int. Cl. C05c *9/00*
U.S. Cl. 71—28 **3 Claims**

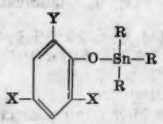
A liquid fertilizer suspension containing ureaform having a water insoluble nitrogen content of at least 1.5% and an activity index in excess of 60. The process for producing said suspension is concerned with diluting a urea-formaldehyde reaction product containing urea and formaldehyde having a mole ratio between 1:1 to 2:1 with water to form a 35–65% urea-formaldehyde solution, lowering the pH to below 5, heating said solution at a temperature ranging from 30–80° to form a suspension and adding an alkaline material to said suspension to raise the pH to above 5.

3,677,737
COMBATING UNWANTED VEGETATION WITH 2-(2',5' - DIMETHYLPYRROLIDINYL) - 5 - ARYL-1,3,4-THIADIAZOLES
Norman A. Dahle, Mission, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Oct. 24, 1969, Ser. No. 869,328
Int. Cl. A01n *9/12*
U.S. Cl. 71—90 **4 Claims**

A small group of 2-(2',5'-dimethylpyrrolidinyl)-5-phenyl-1,3,4-thiadiazoles, in which the phenyl ring may have chloro or methyl substituents, possess herbicidal properties superior to compounds of similar structural formulas. Various compounds of the group are useful for controlling unwanted vegetation in soybeans, cotton and small grains.

3,677,738
METHOD FOR THE CONTROL OF PESTS WITH TRIORGANOTIN (SUBSTITUTED PHENOXIDES)
Pasquale P. Minieri, Woodside, N.Y., assignor to Tenneco Chemicals, Inc.
No Drawing. Original application Feb. 28, 1968, Ser. No. 708,802, now Patent No. 3,524,869, dated Aug. 11, 1970. Divided and this appplication Nov. 6, 1969, Ser. No. 871,262
Int. Cl. A01n *9/00*
U.S. Cl. 71—97 **19 Claims**

Organotin compounds that have the structural formula



wherein each R represents an alkyl group having from 4 to 8 carbon atoms or a phenyl group; one of the X substituents represents an alkyl group having from 4 to 8 carbon atoms, phenyl, or methyl; the other X substituent represents hydrogen, halogen, nitro, or an alkyl group having from 1 to 4 carbon atoms; and Y represents hydrogen, halogen, or nitro are useful in the control of the growth of undesirable organisms.

3,677,739
HERBICIDAL 3,4,5-TRISUBSTITUTED BENZAMIDES
Bruce W. Horrom, Waukegan, and Aldo J. Crovetti, Lake Forest, Ill., and Kenneth L. Viste, Warminster, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.
No Drawing. Continuation-in-part of application Ser. No. 671,946, Oct. 2, 1967, which is a continuation-in-part of application Ser. No. 608,271, Jan. 10, 1967. This application Mar. 5, 1969, Ser. No. 804,678
Int. Cl. A01n *9/20*
The portion of the term of the patent subsequent to Oct. 13, 1987, has been disclaimed
U.S. Cl. 71—118 **3 Claims**

Herbicidal compositions containing as the active ingredient a novel compound belonging to the class of N-(1,1-dimethylpropynyl)-3,4,5-trisubstituted benzamides.

3,677,740
PROCESS OF BENEFICIATING TITANIFEROUS BEACH SAND
Frank Ronald Williams, Yarm, Jack Whitehead, Acklam, Jefferson Marshall, Stockton-on-Tees, Alan Conners, Balcombe, and Derek Vernon Gosden, Horsham, England, assignors to British Titan Products Company Limited, Billingham, Teesside, England
No Drawing. Filed July 31, 1970, Ser. No. 60,128
Claims priority, application Great Britain, July 31, 1964, 38,476/64
Int. Cl. C21b *1/00*; C22b *1/00*
U.S. Cl. 75—1 **16 Claims**

A process for the beneficiation of iron-containing titaniferous material suitable for attack by sulphuric acid in which a beach sand ilmenite is oxidised at a temperature in the range 700° C. to 800° C. and the iron content is thereafter reduced at an elevated temperature to a ferrous state before leaching the material with aqueous hydrochloric acid to produce a material, when dry, containing between 75% and 90% of titanium, expressed as TiO_2.

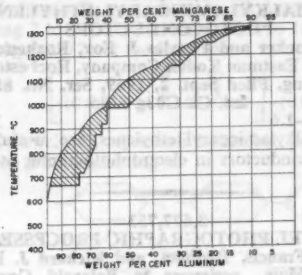
3,677,741
METHOD OF PROCESSING FERROPHOSPHORUS
Jurgen A. Stenzel, Brentwood, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Aug. 24, 1970, Ser. No. 66,649
Int. Cl. C21c *7/02*; C22b *5/00*
U.S. Cl. 75—28 **9 Claims**

Phosphorus is substantially completely removed from ferrophosphorus by heating the ferrophosphorus in admixture with an oxidizing agent and a neutralizing agent to at least sintering temperature in a container having oxide refractory walls and leaching with an alkaline solution. The residual phosphorus free metal values have recognized utility in the metallurgical industry and the phosphates are useful in fertilizer, feed and detergent technology.

3,677,742
PROCESS FOR INCREASING THE PERCENTAGE OF ALUMINUM IN ALUMINUM-MANGANESE ALLOYS
Charles Toth, Westwego, La., assignor to Applied Aluminum Research Corporation, Westwego, La.
Filed Dec. 31, 1969, Ser. No. 889,402
Int. Cl. C22b *21/02, 21/06*
U.S. Cl. 75—68 B **12 Claims**

Process for increasing the percentage of aluminum in an aluminum-manganese alloy comprising bringing a

liquid solution of said alloy to a temperature sufficient to effect phase separation into a solid phase rich in manganese



and a liquid phase rich in aluminum and isolating these phases from each other.

3,677,743

MIXING AND SETTLING SEPARATION PROCESS FOR URANIUM OR PLUTONIUM

William J. Walsh and Robert Dean Pierce, Naperville, Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed June 3, 1969, Ser. No. 830,080
Int. Cl. C22b *61/04*
U.S. Cl. 75—84.1 5 Claims

A process and apparatus for separating fission products from uranium and/or plutonium employing liquid metals and liquid salts as solvents is disclosed. A solution of uranium and/or plutonium in a liquid metal is flowed sequentially into and through a plurality of mixer-settlers containing a liquid salt which remove certain fission products from the feed solution as well as a small proportion of the uranium and/or plutonium. The uranium and/or plutonium is removed from the feed solution in another mixer-settler and the liquid metal solvent is recycled to the first mixer-settler where it washes all of the uranium and/or plutonium from the liquid salt present therein. The liquid salt in the first mixer-settler is discarded, the liquid salt in subsequent mixer-settlers is transferred between stages and fresh liquid salt is added to the last mixer-settler. Also disclosed is a system including a plurality of mixer-settlers which include an L-shaped baffle in the settling chamber.

3,677,744

AGE HARDENING STAINLESS STEEL

Katsumi Yamamura, Hiroshi Harigaya, and Kazutomo Kasai, Suwa-shi, and Michio Asahina, Okaya-shi, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,431
Claims priority, application Japan, Mar. 7, 1968, 43/14,498; Mar. 19, 1968, 43/17,689
Int. Cl. C22c *13/20*
U.S. Cl. 75—128 T 6 Claims

Corrosion and heat resistance, workability and toughness of age-hardenable Fe-Mo alloys are improved by the addition of Cr, Ni and Co. The age hardenability is reinforced by the addition of W, Be, Ti and Si. Resistance to non-oxidizing acids is improved by addition of Cu.

3,677,745

COPPER BASE COMPOSITION

Walter L. Finlay, New York, N.Y., and Henry J. Fisher, Wellesley Hills, and Donald A. Hay, Medfield, Mass., assignors to Cooper Range Company, New York, N.Y.

Filed Feb. 24, 1969, Ser. No. 802,330
Int. Cl. C22c *9/00*
U.S. Cl. 75—153 10 Claims

A copper-magnesium-phosphorus alloy (optionally containing silver and/or cadmium) wherein the magnesium is present in amounts from 0.01 to 5.0 weight percent, the phosphorus from 0.002 to 4.25 weight percent with copper making up the remainder. When silver or cadmium are employed, they are employed in amounts of from 0.02 to 0.2 weight percent and from 0.01 to 2.0 weight percent, respectively. These alloys have unexpectedly good combinations of mechanical heat resistance and conductivity properties.

3,677,746

HEAT TREATABLE ALLOY

Carl H. Lund, Arlington Heights, John Hockin, Palatine, and Michael J. Woulds, Schaumburg, Ill., assignors to Martin Marietta Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 841,602, July 14, 1969. This application Jan. 19, 1970, Ser. No. 4,044
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 3 Claims

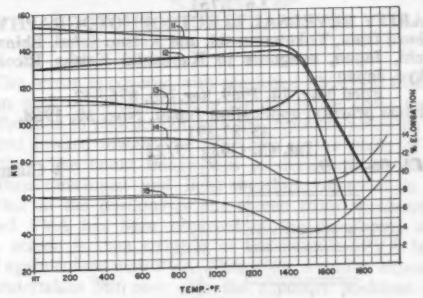
An alloy and castings made therefrom containing in percent by weight about 0.08% carbon, about 15% chromium, about 18.5% cobalt, about 5.2% molybdenum, about 3.5% titanium, about 4.3% aluminum, about 0.03% boron, up to about 0.3% zirconium, about 0.8% to about 2% hafnium with the balance being essentially nickel.

3,677,747

HIGH TEMPERATURE CASTABLE ALLOYS AND CASTINGS

Carl H. Lund and John Hockin, Arlington Heights, and Michael J. Woulds, Schaumburg, Ill., assignors to Martin Marietta Corporation, New York, N.Y.

Continuation-in-part of applications Ser. No. 725,074, Apr. 29, 1968, Ser. No. 841,408, Ser. No. 841,504, and Ser. No. 841,505, all July 14, 1969. This application June 28, 1971, Ser. No. 157,335
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 49 Claims



Nickel-base alloys useful in the form of castings as gas turbine engine hardware and processes with respect to such nickel-base alloys wherein special amounts of hafnium are employed to enhance ductility of virgin alloy, to overcome ductility deficiencies in alloys containing revert and to constitute an integral part of the process of making cast objects such as gas turbine blades which are subjected in use to the combined effects of high stress at high temperatures.

3,677,748
ALLOY
John Hockin, Arlington Heights, Ill., assignor to Martin Marietta Corporation, New York, N.Y.
No Drawing. Filed Nov. 19, 1969, Ser. No. 878,233
Int. Cl. C22c 19/00
U.S. Cl. 75—171 5 Claims

A nickel-base alloy useful at elevated temperatures under stress which contains in percent by weight about 8% chromium, about 10% cobalt, about 0.1% carbon, about 4% molybdenum, about 4.25% tantalum, about 6% aluminum, about 1% titanium, about 2% tungsten, about 1.5% hafnium, about 0.08% zirconium, about 0.015% boron with the balance being essentially nickel.

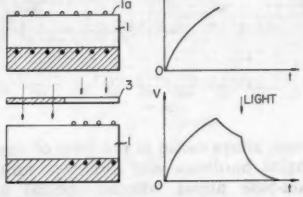
3,677,749
METHOD OF MAKING HIGH-DENSITY SINTERED CHROMIUM-BEARING IRON ALLOYS
Hugh R. McCurdy, Doyle W. Rausch, and Hoy O. McIntire, Columbus, Ohio, assignors to The Battelle Development Corporation, Columbus, Ohio
No Drawing. Filed Oct. 15, 1969, Ser. No. 866,740
Int. Cl. B22f 1/00
U.S. Cl. 75—211 15 Claims

Chromium-bearing iron articles and particularly chromium-bearing steel articles such as stainless steel objects are produced by compacting, reducing, and sintering mixtures of metal compound powders and ferrochromium powders. At least 35 percent, by weight, of the powder is of a particle size less than 10 microns.

3,677,750
PHOTOELECTROSOLOGRAPHIC IMAGING PROCESS
Joseph Mammino, Penfield, N.Y., and Gail D. Jvirblis, Mountain View, Calif., assignors to Xerox Corporation, Rochester, N.Y.
Continuation-in-part of application Ser. No. 553,836, May 31, 1966, now abandoned. This application Sept. 12, 1969, Ser. No. 857,429
Int. Cl. G03g 13/00
U.S. Cl. 96—1 8 Claims

A photoelectrosolographic imaging system utilizing a plate overcoated with a soluble layer. An image is formed on the plate by forming an electrostatic latent image on the surface and treating the surface with a solvent for the soluble layer whereby the layer dissolves away selectively in the uncharged areas.

3,677,751
POLARITY REVERSAL ELECTROPHOTOGRAPHY
Wasaburo Ohta, Yokohama-shi, and Katsuo Sakai, Ebina-machi, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Nov. 14, 1969, Ser. No. 876,952
Claims priority, application Japan, Nov. 30, 1968, 43/87,891
Int. Cl. G03g 13/22
U.S. Cl. 96—1 R 2 Claims



An electrophotography method wherein a photosensitive layer is charged up in the dark, the photosensitive layer being overcoated by an insulator layer, and a charge of the polarity opposite to that of the initial charge is applied on the insulator layer in a quantity less than that of the initial charge, and thereafter, the electric polarity at the spots corresponding to the light and dark spots of an original is reversed by an image light projection.

3,677,752
BIS(DIALKYLAMINOARYL)ETHYLENE PHOTOCONDUCTORS
Jerome J. Looker and Charles J. Fox, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Sept. 2, 1969, Ser. No. 854,718
Int. Cl. G03g 5/06
U.S. Cl. 96—1.6 2 Claims

1,1-bis(dialkylaminoaryl)ethylenes are useful as organic photoconductors in electrophotographic systems.

3,677,753
NOVEL PHOTOGRAPHIC PROCESSES
Donald R. Francis, Dedham, and Richard J. Haberlin, Weston, Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed July 13, 1970, Ser. No. 54,488
Int. Cl. G03c 5/54
U.S. Cl. 96—29 16 Claims

A composite film structure comprising a laminate including a common support carrying on one surface a layer containing silver precipitating nuclei and a layer containing photosensitive silver halide crystals, wherein said layer containing photosensitive silver halide crystals is located distal to said support; is exposed to actinic radiation and processed by contacting with a processing composition whereby a transfer image is formed in said layer containing silver precipitating nuclei, and, subsequent to said image formation, the layer containing photosensitive silver halide is removed by contacting said layer with a rotating roller having coated thereon a material having a greater adhesion for said layer than adjacent layers on said film structure has for said layer. The film unit preferably contains an additive color screen. The described film structure is particularly suitable for use as motion picture film.

3,677,754
PHOTOSENSITIVE ELEMENT COMPRISING LIGHT-SENSITIVE POLYMERS AND PROCESS OF USING
John A. Ford, Jr., Robert C. McConkey, and Thomas M. Laakso, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Original application Aug. 1, 1969, Ser. No. 846,952, now Patent No. 3,627,732. Divided and this application Feb. 16, 1971, Ser. No. 115,689
Int. Cl. G03c 1/68
U.S. Cl. 96—35.1 6 Claims

There is described a novel class of light-sensitive polyesters containing a 1-arylmethylidyne-3-indenecarboxylate group or a 5-arylmethylidyne - 3 - furanonecarboxylate group as an integral part of the polymer backbone. The polymers are insolubilized upon exposure to actinic radiation and are useful in the preparation of photomechanical images.

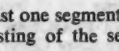
3,677,755
RELIEF LITHOGRAPHIC PLATES AND PHOTOSENSITIZING SOLUTIONS
Hisaaki Fukui and Taketoshi Araki, Tokyo, and Yoshikane Fuchi, Iruma-gun, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
No Drawing. Filed Aug. 28, 1969, Ser. No. 853,948
The portion of the term of the patent subsequent to Feb. 22, 1989, has been disclaimed
Int. Cl. G03c 5/00
U.S. Cl. 96—35.1 13 Claims

A photosensitizing solution having a viscosity of about 5 to 150 centipoises at 20° C. comprising:

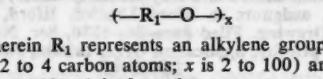
(I) a photopolymerizable component comprising

(A) an unsaturated polyester having a fusing point above 100° C. containing in the molecule

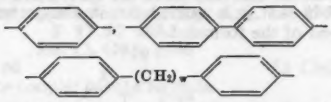
at least one segment (a) selected from the group consisting of the segment (1) of the formula:



(wherein R_1 represents an alkylene group having 2 to 4 carbon atoms; x is 2 to 100) and the segment (2) of the formula:



(wherein R_2 represents a member selected from the group consisting of



and naphthylene group; y is 2 to 4; z is 1 to 10; and w is 1 to 4) and the segment (b) corresponding to the residue of an unsaturated dicarboxylic acid;

(B) about 10 to 150 parts by weight, based upon 100 parts by weight of said unsaturated polyester (A), of at least one ethylenically unsaturated monomer, different from the unsaturated polyester polymer (A); and

(C) about 0.01 to 5 parts by weight, based upon 100 parts by weight of said unsaturated polyester, of a photopolymerization initiator;

(II) at least one solvent selected from the group consisting of chlorinated aliphatic hydrocarbons, brominated aliphatic hydrocarbons, ketones, cyclic ethers and pyridine, said solvent having a relative drying velocity of 500 to 10,000.

This photosensitizing solution is coated in a thickness between 10 to 200μ on a support and exposed to actinic light through an image transparency. Then, the non-exposed area is removed and the surface is treated with a desensitizing agent to give a relief lithographic plate.

3,677,756

METHOD OF DRY POWDER ETCHING

Thomas F. Protzman, Worthington, Ohio, assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Filed Sept. 21, 1970, Ser. No. 74,122
Int. Cl. G03c 5/00
U.S. Cl. 96—36 **14 Claims**

The process for etching an etchable layer without a resist comprising the steps of exposing an etchable layer bearing a light-sensitive layer capable of receiving a powder in image-wise configuration to actinic radiation to form a latent powder-receptive image; developing said latent image with superficially dry etchant particles to form a layer of etchant particles in image-wise configuration; removing etchant particles from the non-image areas of said light-sensitive layer, and carrying out said etching reaction in a predetermined configuration conforming to the image-wise configuration of the superficially dry etchant particles.

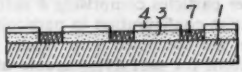
3,677,757

METHOD OF MAKING PHOSPHOR SCREEN FOR COLOR CATHODE RAY TUBE

Masahiro Nishizawa, Kawasaki, Japan, assignor to Nippon Columbia Kabushikikaisha (Nippon Columbia Co. Ltd.), Tokyo, Japan

Filed June 22, 1970, Ser. No. 48,027
Claims priority, application Japan, June 28, 1969, 44/51,122
Int. Cl. H01j 1/54, 9/22
U.S. Cl. 96—36.1 **9 Claims**

A method of making a phosphor screen of a multicolor cathode ray tube which comprises the steps of coating the inner face of the faceplate of the cathode ray tube with a photosensitive adhesive binder depositing a positive photosensitive layer over the entire area of the coated photosensitive adhesive binder, drying the deposited photoresist, exposing the photoresist layer to irradiation by light through a mask having a predetermined pattern to expose the underlying photosensitive adhesive binder layer at predetermined areas, developing the exposed inner face of



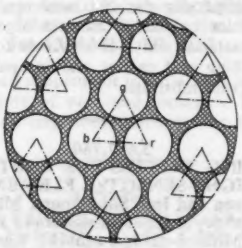
the faceplate to remove the photoresist layer from the photosensitive adhesive binder layer to expose it at those areas exposed to light, rinsing the developed inner face of the faceplate with water, and dusting phosphor of a desired color on the exposed areas of the photosensitive adhesive binder layer. The photosensitive adhesive binder is insoluble in water and in a developer after being exposed to light and becomes sticky due to absorption of water.

3,677,758

SCREENING A BLACK-SURROUND COLOR CATHODE-RAY TUBE

Sam H. Kaplan, Chicago, Ill.. assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Dec. 21, 1970, Ser. No. 99,949
Int. Cl. G03c 5/00
U.S. Cl. 96—36.1 **10 Claims**



The screen is covered with sensitized PVA and exposed from each of three positions simulating the three beams of the tube in process but with the exposure positions displaced inward toward the tube axis in the plane of deflection. The latent image thus produced on the screen is then developed and light-absorbing material is deposited in the portions of the screen from which unexposed PVA has been removed in the developing step. The screen is then stripped of the remnant PVA layer and again coated with PVA. Thereafter, a similar exposure is undertaken but now with the exposure positions displaced outwardly from the tube axis in the plane of deflection. Following the this there is a further development step and again the deposition of light-absorbing material on the portions of the screen from which PVA has been removed. The three exposure positions in each of these two sequences of process steps cause the matrix, which is made in two segments, to exhibit approximately circular holes properly located to receive phosphor and form the customary phosphor dot triads on the screen of the tube.

3,677,759

PHOTOGRAPHICALLY PRODUCING MOLECULARLY DISPERSED DYE IMAGES

Rexford W. Jones and William B. Thompson, Columbus, Ohio, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Continuation-in-part of application Ser. No. 796,897, Feb. 5, 1969. This application June 16, 1969, Ser. No. 833,771

Int. Cl. G03c *1/68, 5/24*

U.S. Cl. 96—48 8 Claims

Process of molecularly dispersing particulate dye images wherein powder particles comprising a carrier and a dye, held in imagewise configuration in particulate form in or on a substrate, are contacted with vapors of a material, which is a solvent for said dye, capable of swelling said carrier and incapable of swelling the surface of said substrate, molecularly dispersing said dye in said carrier. Line, continuous-tone or half-tone images are preferably produced by exposing to actinic radiation in image-receiving manner a substrate bearing a positive-acting or negative-acting light-sensitive organic layer having a thickness of at least 0.1 micron, said layer being capable of developing a R_d of 0.2 to 2.2; continuing the exposure to either clear the background of positive-acting light-sensitive layers or to establish a potential R_d of 0.2 to 2.2 with negative-acting light-sensitive organic layer; applying to said layer of organic material, free flowing powder particles having a diameter, along at least one axis of at least about 0.3 micron but less than 25 times the thickness of said organic layer wherein said powder particles comprise a solid carrier and dye; while the layer is at a temperature below the melting points of the powder and of the organic layer, physically embedding said powder particles as a monolayer in a stratum at the surface of said light-sensitive layer to yield images having portions varying in density in proportion to the light exposure of each portion, removing non-embedded particles from said organic layer to develop an image; and molecularly dispersing dye into said carrier by contacting the particles embedded in said organic layer with vapors of a material which is a solvent for said dye, capable of swelling said carrier and incapable of swelling the surface of said substrate.

3,677,760

HARDENING PROCESS FOR PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENTS

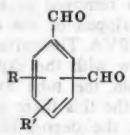
Haruhiko Iwano and Isao Shimamura, Minami-Ashigara-machi, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara-machi, Kanagawa, Japan

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,101
Claims priority, application Japan, Apr. 19, 1968, 43/26,341

Int. Cl. G03c *1/30, 5/26, 5/30*

U.S. Cl. 96—50 PT 6 Claims

A process for hardening a silver halide photographic light-sensitive element, which comprises processing the light-sensitive element in a processing bath containing formaldehyde and aromatic dialdehyde represented by the general formula:



wherein R and R′ each represents one member selected from the group consisting of a hydrogen atom, a lower alkyl group having 1–5 carbon atoms, and a group capable of increasing water solubility, said group being a member selected from the group consisting of SO_3H, COOH, OH and the Na K or NH_4 salt thereof.

3,677,761

DEVELOPMENT PROCESS

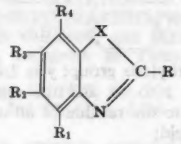
John Colin Brown and Roy Anthony Cheer, Ilford, England, assignors to Ilford Limited, Ilford, England

No Drawing. Filed June 26, 1970, Ser. No. 50,314
Claims priority, application Great Britain, June 26, 1969, 32,426/69

Int. Cl. G03c *1/06, 1/34, 5/30*

U.S. Cl. 96—66.5 5 Claims

This invention describes a process for the production of a photographic record which comprises developing photographic material having a gelatino silver halide emulsion containing a developable silver image in a silver halide developing solution, the process being characterised in that it is carried out in the presence of a compound of the formula:



where X represents an oxygen, sulphur or selenium atom, R represents a hydrogen atom or an alkyl or substituted alkyl group, an aralkyl group, an aryl group or a group SR_5 where R_5 represents a hydrogen atom or an alkyl or substituted alkyl group, at least one of R_1, R_2, R_3 or R_4 is a nitro group and the remainder are each selected from a hydrogen or a halogen atom, or an alkyl, aralkyl, alkoxy, mono- or di-alkylamino, acylamino or a nitro group.

3,677,762

COLOR ELEMENTS CONTAINING BRIGHTENING AGENTS AND ULTRAVIOLET ABSORBERS

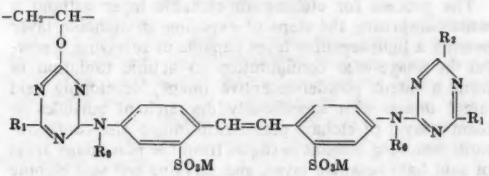
Hiroyuki Amano, Nobuo Tsuji, and Kazuo Shirasu, Minami-Ashigara-machi, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara-machi, Kanagawa, Japan

No Drawing. Filed Jan. 8, 1970, Ser. No. 1,564
Claims priority, application Japan, Jan. 8, 1969, 44/1,554

Int. Cl. G03c *1/76*

U.S. Cl. 96—74 12 Claims

Color printing papers comprising multiple photographic layers, wherein at least one of the layers contains an ultraviolet absorber, with one of the layers containing a fluorescent brightening agent having the repeating formula



are disclosed. The color printing papers have increased whiteness.

3,677,763

PIGMENTED PHOTOSENSITIVE POLYMER SYSTEM

Charles D. De Boer and George W. Luckey, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 17, 1970, Ser. No. 29,663

Int. Cl. G03c *1/68*

U.S. Cl. 96—82 14 Claims

Photosensitive polymeric elements provide high relief images of good resolution when subjected to imagewise exposure to X-ray radiation and solvent development. Fluorescent pigments or phosphors which are dispersed in a light-sensitive polymer having unsaturated cyclic

groups appended to the polymer backbone absorb the X-ray energy and transfer it to the polymer as actinic radiation thereby causing in-depth insolubilization of the polymer.

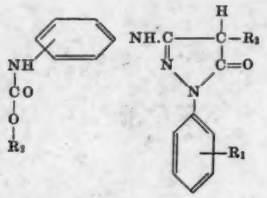
3,677,764

SILVER HALIDE EMULSION CONTAINING PURPLE COUPLER FOR COLOR PHOTOGRAPHY AND PROCESS OF MAKING THE SAME

Hans Glockner, Pullach, Ernst Meier, Munich, and Walter Puschel, Leverkusen, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Aug. 12, 1969, Ser. No. 849,498
Claims priority, application Germany, Aug. 14, 1968, P 17 97 083.1
Int. Cl. G03c 1/40
U.S. Cl. 96—100 13 Claims

A purple color coupler has the formula



wherein R_1 is hydrogen or one of the substituents usually employed with 1-phenyl-pyrazolones; R_2 is alkyl, cycloalkyl, aryl or aryloxyalkyl or one of these groups which is substituted as customary in pyrazolone couplers; R_3 is hydrogen or a substituent as customary in pyrazolone couplers which, upon color development, is split off; and wherein at least one of R_1 and R_2 is or includes an antifusion straight-chain or branched hydrocarbon group having from 8 to 20 carbon atoms.

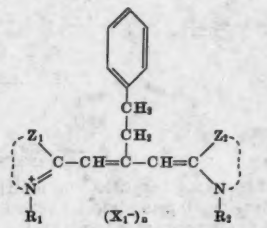
3,677,765

SILVER HALIDE SUPERSENSITIZED PHOTOGRAPHIC EMULSION

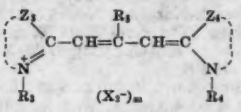
Yoshiyuki Nadazawa, Yashuharu Nakamura, Haruo Takei, Akira Sato, and Tadashi Ikeda, Minami-Ashigara-machi, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara-machi, Kanagawa, Japan

No Drawing. Filed Feb. 10, 1971, Ser. No. 114,338
Claims priority, application Japan, Feb. 10, 1970, 45/11,586
Int. Cl. G03c 1/14
U.S. Cl. 96—124 7 Claims

A silver halide light-sensitive photographic emulsion containing a combination of at least one sensitizing dye represented by the following Formula I and at least one sensitizing dye represented by the following Formula II:



wherein R_1 and R_2 each represents a lower alkyl group or a substituted lower alkyl group, Z_1 and Z_2 each represents an atomic group necessary to complete a benzothiazole nucleus, a benzoselenazole nucleus or a naphthothiazole nucleus, X_1 represents an anion, and n represents 0 or 1, $n=0$ when an intra-molecular salt is formed;



wherein R_5 represents a lower alkyl group and R_3, R_4, Z_3, Z_4, X_2 and m each has the same meaning as R_1, R_2, Z_1, Z_2, X_1 and n respectively.

3,677,766

METHOD OF FORMING GELATIN IMAGE

Yasui Tamai, Sadao Osawa, and Seiichi Taguchi, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara-machi, Kanagawa, Japan

No Drawing. Filed Feb. 20, 1970, Ser. No. 13,238
Claims priority, application Japan, Feb. 21, 1969, 44/13,019
Int. Cl. G03g 13/10, 13/20, 13/22
U.S. Cl. 96—1 LY 6 Claims

A method of preparing a gelatin image, which comprises forming an electrostatic latent image on an electrophotographic light-sensitive layer; converting said latent image into a gelatin image using an electrophotographic developer containing gelatin fine grains; applying small droplets of water to the surface of said light-sensitive layer carrying said gelatin image; said water being in an amount sufficient to adhere the gelatin fine grains forming said gelatin image to the surface of said light-sensitive layer; and, hardening said gelatin image, is disclosed.

3,677,767

MOLASSES-UREA REACTION MIXTURES

Larry Cecil McNeff, Wayzata, Minn., assignor to Cargill, Incorporated, Minneapolis, Minn.

No Drawing. Filed Mar. 9, 1970, Ser. No. 17,946
Int. Cl. A23k 1/02, 1/22
U.S. Cl. 99—6 14 Claims

An animal feed supplement is provided which comprises a reaction mixture of urea and molasses. The feed supplement provides improved nutrition for ruminant animals.

3,677,768

PROCESS FOR PRODUCING AN INSTANT CEREAL

Stanley Martin Mokrzycki, Avenel, Edwin Leon Sexton, Middletown, Thomas George Powers, Bayonne, and Daniel Melnick, West Englewood, N.J., assignors to CPC International Inc.

No Drawing. Filed Aug. 19, 1969, Ser. No. 851,441
Int. Cl. A23l 1/10
U.S. Cl. 99—83 13 Claims

A process for producing an instant cereal product by moistening cereal granules, tempering the moistened granules, partially pregelatinizing and drying them, and recovering an instant cereal product. The instant cereal produced in this manner hydrates substantially instantaneously.

3,677,769

MULTITEXTURED AND PATTERNED DOUGHS

Charles W. King, Minneapolis, Minn., assignor to General Mills, Inc.

Filed May 28, 1970, Ser. No. 41,339
Int. Cl. A21d 8/02
U.S. Cl. 99—86 5 Claims

A process for registering patterns on yeast leavened dough. In selected areas of the dough, the yeast is inactivated by heat thus impairing rising and forming depressed areas in the final baked product.

3,677,770
CARBONATED CANDY
Frank Witzel, Spring Valley, N.Y., assignor to Beech-Nut, Inc., New York, N.Y.
No Drawing. Filed Oct. 7, 1970, Ser. No. 78,910
Int. Cl. A23g 3/00
U.S. Cl. 99—134 R 2 Claims

The off-taste present in effervescent hard candy due to unreacted food acidulant as well as salt formed by the reaction of the efferverscent factors, i.e., leavening agent and acidulant, is overcome by incorporating a small amount of a saccharin into the candy.

3,677,771
PROCESS FOR THE MANUFACTURE OF CARAMELS
Charles Wesley Kolar, Jr., St. Louis, Mo., assignor to Ralston Purina Company, St. Louis, Mo.
No Drawing. Filed Sept. 21, 1970, Ser. No. 74,176
Int. Cl. A23g 3/00
U.S. Cl. 99—134 R 30 Claims

Production of a caramel-type confectionary product from a reconstitutable dried condensed milk product made by mixing concentrated fluid dairy whey with a proteinaceous source such as casein adding a partially hydrogenated fat to said mixture; drying the condensed milk product, and incorporating therewith a sequestering agent to sequester any calcium ions present in the milk product upon reconstitution and to prevent undesired calcium induced coagulation of the protein during subsequent heating to produce the caramel confection.

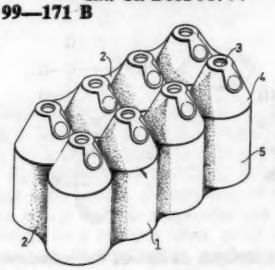
3,677,772
CYCLOALKYL MERCAPTAN COMPOSITIONS AND PROCESSES THEREFOR
Cynthia Mussinan, Bricktown, Christopher Giacino, Califon, and Ira Katz, Elberon, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
No Drawing. Filed May 14, 1970, Ser. No. 37,305
Int. Cl. A23l 1/26
U.S. Cl. 99—140 R 22 Claims

Foodstuff, flavor augmenting and flavor imparting compositions containing a quantity of cycloalkyl mercaptan sufficient to alter the organoleptic characteristics of said composition.

3,677,773
METHOD FOR THE PRODUCTION OF A FLAVOR ENHANCING CRYSTAL
Jinshichi Naka, Toyonaka, Yasunori Tokuda, Takasago, Takehiko Koono, Kobe, and Jun Utsugi, Kakogawa, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
Continuation-in-part of application Ser. No. 383,506, July 17, 1964. This application Sept. 2, 1965, Ser. No. 484,693
Claims priority, application Japan, Mar. 29, 1965, 40/18,216
Int. Cl. A23l 1/22
U.S. Cl. 99—140 N 4 Claims

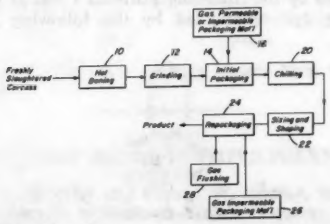
1. A method for preparing flavor-enhancing crystals, each of which homogeneously consists of substantially from 2 to 10% by weight on anhydrous basis of disodium salt of flavorous 5'-nucleotide and monosodium glutamate, said crystals being effectively convertible as a unitary entity into the liquid phase in aqueous aluminum salt solution at about pH 6 without perceptible formation of precipitate, even when viewed under the microscope, which method comprises the steps of preparing a hot aqueous solution of alkali salt of flavorous 5'-nucleotide and monosodium glutamate in an amount of 20 to 62% by weight in which the ratio by weight of alkali salt of flavorous 5'-nucleotide to monosodium glutamate is 2 to 12:100 and at a temperature higher than 40° C., adding gradually from 10 to 75% by volume of a freely water-miscible organic solvent to the hot aqueous solution under gentle stirring while avoiding rapid drop of the local temperature of the hot solution, gradually lowering the temperature of the aqueous mixture at a rate of about 1 to 3 degrees centigrade per hour, and collecting the resulting crystalline material from the aqueous mixture.

3,677,774
COMBINED PACKAGE CONTAINING AN ENCLOSED GASEOUS ATMOSPHERE FOR PRESERVATION
Anders Ruben Rausing, Rome, Italy, assignor to Sobrefina S.A., Fribourg, Switzerland
Filed Feb. 9, 1970, Ser. No. 9,730
Claims priority, application Sweden, Feb. 25, 1969, 2,539/69
Int. Cl. B65f 31/04
U.S. Cl. 99—171 B 2 Claims



A combined package having extended shelf-life for a plurality of plastic containers for beer or carbonated beverages in which the plastic containers have an unacceptable permeability for carbon dioxide gas which includes a heat-shrunk, sealed envelope enclosing the containers and composed of a plastic material having a low permeability for the carbon dioxide gas, said envelope containing pressurized carbon dioxide gas so that the difference in partial pressures of the gas in the containers and the envelope is less than the difference in partial pressures of the carbon dioxide in the container and the atmosphere.

3,677,775
METHOD OF PREPARING AND PACKAGING PORTION SHAPED MEAT PRODUCTS
Paul W. Vogel, Pekin, Ill., assignor to Bird Provision Co.
Continuation of abandoned application Ser. No. 798,421, Feb. 11, 1969. This application June 2, 1971, Ser. No. 149,388
Int. Cl. A22c 18/00; B65b 25/06
U.S. Cl. 99—174 23 Claims



Meat that is shaped and sized into individual consumer portions after initial packaging, is sealed for prolonged storage in a gas-impermeable re-packaging material. Prior to initial packaging, the meat is ground while in a warm and fluent state shortly after slaughter of the animal. After shaping and sizing the meat into consumer portions, it is gas flushed during repackaging to reduce the amount of entrapped oxygen.

3,677,776

ELECTROLESS PLATING SOLUTIONS FOR CADMIUM AND CADMIUM COPPER ALLOYS

Charles Raymond Shipley and Michael Gulla, Newton, and Oleh Borys Dutkewych, Medfield, Mass., assignors to Shipley Company, Inc., Newton, Mass.

No Drawing. Filed Mar. 12, 1971, Ser. No. 123,840
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 40 Claims

This invention relates to electroless deposition of cadmium and alloys of cadmium and copper. The invention is based upon two discoveries, the first being that up to about 25% by weight cadmium can be codeposited with copper by the simple substitution of a cadmium salt for a copper salt in an electroless copper depositing formulation. The second discovery is that if the electroless copper solution also contains a trace quantity of mercury, any portion of the copper salt in the electroless depositing solution can be replaced by the cadmium salt provided that a trace of copper is retained to initiate the reaction and provided further, that the solution also contains a chelating agent for the cadmium which may be the same as the chelating agent for the copper. In accordance with the invention, deposits can be obtained that are essentially pure electroless cadmium rich cadmium-copper alloys or copper rich copper-cadmium alloys.

3,677,777

ANTIFOULING PAINT

Keiichiro Ishii and Michio Ueyama, Tokyo, Koshin Miyazaki, Takaoka-shi, and Tetsuo Noto, Takarazuka-shi, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

No Drawing. Filed Aug. 26, 1968, Ser. No. 755,421
Claims priority, application Japan, Aug. 29, 1967, 42/54,961
Int. Cl. C09d *5/14*
U.S. Cl. 106—15 AF 4 Claims

The present invention relates to antifouling paints containing 2 - (N,N-dimethylthiocarbamoylthio) - 5-nitrothiazol and/or 2-(N,N-diethylthiocarbamoylthio)-5-nitrothiazol as antifouling agent.

3,677,778

ZINC-LANTHANUM BORATE GLASS COMPOSITION

Mir Akbar Ali, Evanston, and Murray A. Schwartz, Glencoe, Ill., and Pei Ching Li, Hopewell Junction, N.Y., assignors to IIT Research Institute, Chicago, Ill.

Filed Sept. 16, 1969, Ser. No. 858,450
Int. Cl. C03c *3/00, 13/00*
U.S. Cl. 106—47 Q 2 Claims

A glass suitable for the transmission of radiation in the near ultraviolet region. The glass is composed of B_2O_3, La_2O_3 and ZnO and is substantially free of ultraviolet absorbers.

3,677,779

PROCESS FOR IMPROVING THE HYDRATION RESISTANCE OF DEAD-BURNED MAGNESIA

Vaughn V. Hughey, Tiffin, Ohio, assignor to Basic Incorporated

No Drawing. Continuation-in-part of application Ser. No. 749,275, Aug. 1, 1968. This application Feb. 16, 1971, Ser. No. 115,712
Int. Cl. C04b *35/04*
U.S. Cl. 106—58 8 Claims

A process of improving the hydration resistance of dead-burned magnesia refractory products in which such a dead-burned magnesia product is treated with a B_2O_3 containing compound. The magnesia is preferably heated to a temperature of at least approximately 300° F., and the B_2O_3 compound is preferably in the form of a solution or suspension heated to a temperature within the range of about 140 to about 212° F. The addition of B_2O_3 compound should be sufficient to add about 0.1 to about 1% by weight of B_2O_3 to the dead-burned magnesia.

3,677,780

METHOD OF PRODUCING HIGH STRENGTH MORTAR OR CONCRETE

Seiya Nishi, Akira Oshio, and Eto Kiyomitsu, Tokyo, Japan, assignors to Onoda Cement Company Limited, Oaza Onoda, Onoda-shi, Yamaguchi, Japan

Filed Aug. 27, 1970, Ser. No. 67,314
Claims priority, application Japan, Aug. 29, 1969, 44/68,004
Int. Cl. C04b *13/28*
U.S. Cl. 106—90 6 Claims

This invention relates to a method of producing high strength mortars or concretes. The process is characterized by curing mortars or concretes incorporated with a salt of β-naphthalenesulphonic acid-formaldehyde condensate in an autoclave.

3,677,781

METHOD OF MAKING CEMENT CLINKERS

Hubert O. Nickelsen, Saratoga, Calif., and Joseph E. Kopanda, Crown Point, and Felix J. Piasecki, Whiting, Ind., assignors to United States Steel Corporation

Continuation-in-part of application Ser. No. 677,991, Oct. 25, 1967. This application July 24, 1970, Ser. No. 58,188
Int. Cl. C04b *7/48*
U.S. Cl. 106—100 10 Claims

The method of making cement clinkers which includes preheating a calcium aluminate or calcium silicate raw mix in granular form to remove surface water and water of crystallization therefrom, and then rapidly heating the preheated raw mix to a temperature below the melting point of the raw mix but not more than 500° F. below the melting point of calcium silicate raw mixes nor more than 250° F. below the melting point of calcium aluminate raw mixes. $CaSO_4$ is added to ferruginous calcium aluminate raw mixes to broaden the sintering range. Also, improved cements made according to this method.

3,677,782

PIGMENTARY FORM OF AN AZOMETHINE

Ian Alexander Macpherson, Paisley, Renfrewshire, Eric Richard Inman, Bridge of Weir, Renfrewshire, John Andrew Stirling, Glasgow, and Alexander McHugh Irvine, Paisley, Renfrewshire, Scotland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed May 20, 1970, Ser. No. 39,162
Claims priority, application Great Britain, May 23, 1969, 26,502/69
Int. Cl. C09c; C07f *1/08*
U.S. Cl. 106—288 Q 16 Claims

The pigmentary form of a metallised o,o'-dihydroxyphenyl-naphthyl azomethine is produced by comminuting it to a mean particle size not exceeding 2.0 microns.

3,677,783

CALCINED MOLYBDATED ZINC OXIDE PIGMENTS AND METHOD OF PREPARATION THEREOF

Truman Kirkpatrick, Lombard, and James Jacob Nilles, Oak Forest, Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Filed Sept. 18, 1969, Ser. No. 859,106
Int. Cl. C09c *1/04*
U.S. Cl. 106—292 7 Claims

This invention provides a method for the manufacture of a novel composition of matter corresponding to

$2ZnO:MoO_3$

and corrosion inhibiting pigmentary particles containing the same by reaction in aqueous slurry of pigmentary zinc oxide and molybdenum trioxide with calcination following particle recovery at elevated but less than sintering temperatures (preferably at about 600° C.).

3,677,784

METHOD FOR PREPARING HYDROPHOBIC SILICA

Siegfried Nitzsche, Wolfgang Kaiser, Ernst Wohlfarth, and Paul Hittmair, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

No Drawing. Filed Jan. 21, 1970, Ser. No. 4,764

Claims priority, application Germany, Jan. 27, 1969, P 19 03 904.4

Int. Cl. C09c *3/00*

U.S. Cl. 106—309 **5 Claims**

Hydrophobic silica filler for silicone rubber stocks can be prepared by reacting organohalogenosilanes with finely divided silica in an aqueous silicasol at a pH in the range from 8.0 to 10.8.

3,677,785

TRANSPARENT CRYSTALLIZED GLASS

Susumu Horikawa, Tokyo, and Kenshi Nakagawa, Tokorozawa-shi, Japan, assignors to Haya Glass Works Limited, Tokyo, Japan

No Drawing. Continuation of application Ser. No. 722,219, Apr. 18, 1968. This application Sept. 24, 1970, Ser. No. 75,288

Claims priority, application Japan, Apr. 25, 1967, 42/26,449

Int. Cl. C04b *33/00*; C03c *3/04*

U.S. Cl. 106—39 DV **4 Claims**

Transparent crystallized glass having a low liquidus temperature, a low thermal expansion and a high bending strength obtained by heating parent glass composed of SiO_2 65 to 75 weight percent, Li_2O 2.5 to 4.5 weight percent, Al_2O_3 15 to 25 weight percent, BaO 1.3 to 4.0 weight percent, MgO 1.3 to 2.0 weight percent, BaO+MgO 2.6 to 5.0 weight percent, ZrO_2 1 to 2 weight percent and TiO_2 1 to 2 weight percent, said parent glass being very stable for devitrification in forming.

3,677,786

LINE DRAWING AND MARKING SYSTEM

Walter G. Hollmann, Lake Forest, and Frederick M. Lozo III, Niles, Ill., assignors to Teledyne, Inc., Los Angeles, Calif.

No Drawing. Filed Oct. 10, 1969, Ser. No. 865,502

Int. Cl. B44f *1/10*; G03c *11/22*

U.S. Cl. 117—1.7 **20 Claims**

Line drawing and marking system characterized by high speed operation which adapts it to computer-controlled recording and plotting. Lines or other markings are formed on a surface or substrate bearing a color-forming iodine reactive substance and an agent for releasing free iodine from alkali metal iodide or ammonium iodide solution by applying such a solution to each area of the surface where a line or other mark is desired. The surface on which the lines or other markings are formed may be any, suitable web such as paper or film and the alkali metal iodide solution may be applied manually or by an electronically controlled pen.

3,677,787

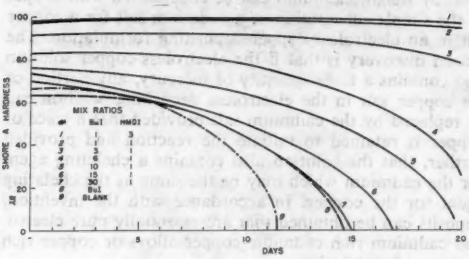
METHOD OF REHARDENING ENCAPSULATING COMPOSITIONS

Joseph M. Augl, Sterling Park, Va., and William J. Bailey, University Park, and Porter W. Erickson, Silver Spring, Md., assignors to the United States of America as represented by the Secretary of the Navy

Filed Oct. 21, 1970, Ser. No. 82,671

Int. Cl. B23p *7/00*; B32b *35/00*

U.S. Cl. 117—2 R **10 Claims**



A method of hardening encapsulating (potting) compositions containing a linkage that is susceptible to hydrolytic cleavage i.e., polyamides, polyester and polyester base type polyurethanes, which are either in the virgin state or which have deteriorated due to exposure to a hot, moist environment by contacting with a chemical hardening agent selected from the group consisting of multifunctional isocyanates, multifunctional epoxides, multifunctional isothiocyanates, carbodiimides and mixtures thereof which may also contain a constituent selected from the group consisting of monoisocyanates, monoepoxides, monoisothiocyanates and mixture thereof.

3,677,788

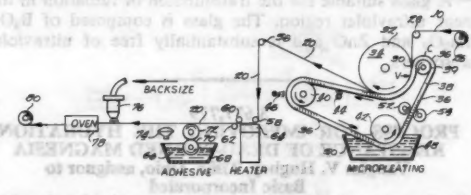
ADHESIVE TAPE

Richard N. Zirnite, Somerset, N.J., assignor to Johnson & Johnson

Filed Feb. 3, 1970, Ser. No. 8,202

Int. Cl. B05c *9/04*; C09j *7/04*

U.S. Cl. 117—11 **10 Claims**



The invention relates to an adhesive tape and features a web comprising a blend of short-fibered wood pulp, hemp and rayon and a flexible binder for the web, the web being micropleated without creping so as to effect linear compaction and impart substantial extensibility thereto. One surface of the compacted web is coated with a pressure-sensitive porous adhesive and, preferably, the opposite surface has a release coating applied thereto. The tape is useful as a flexible and conformable surgical tape.

3,677,789
PROTECTIVE DIFFUSION LAYER ON NICKEL AND/OR COBALT-BASED ALLOYS
Karl Bungardt, Gunter Lehnert, and Helmut W. Meinhardt, Krefeld, Germany, assignors to Deutsche Edelstahlwerke Aktiengesellschaft, Krefeld, Germany
Filed Sept. 10, 1969, Ser. No. 856,539
Claims priority, application Germany, Sept. 14, 1968, P 17 96 175.0
Int. Cl. C23c *9/02*; C23f *17/00*
U.S. Cl. 117—22 **4 Claims**

Nickel and/or cobalt-based alloys are given a protective coating by diffusing into the surface of the alloy metallic aluminum and one or more metals of the platinum group.

3,677,790
READILY REMOVABLE OPAQUE PROTECTIVE LAYERS AND ARTICLES CONTAINING THEM
John F. Bishop, Webster, and Walker F. Hunter, Jr., and Martin E. Rowley, Hilton, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Application Oct. 28, 1968, Ser. No. 788,109, now Patent No. 3,598,591, dated Aug. 10, 1971, which is a continuation-in-part of application Ser. No. 645,032, June 9, 1967. Divided and this application Aug. 12, 1970, Ser. No. 63,292
Int. Cl. G03c *1/84*
U.S. Cl. 117—33.3 **5 Claims**

Readily removable opaque coatings over one or both sides of a photographic or radiographic film, which coatings can be removed in a single piece, can be manufactured by applying over the film a multilayer coating composition comprising

(a) a first "barrier" layer containing one or more water soluble polymers that are compatible with gelatin and that adhere tenaciously to the "opaque" layer (b) and

(b) an "opaque" layer (over the "barrier layer") composed of a blend of finely divided carbon and at least one water-insoluble polymer.

The "opaque" layer must be fairly permeable to water, so that when it is desired to remove the "opaque" coating, the film can simply be immersed in water. Within a very short time the "opaque" layer falls away from the film in a single piece, rather than in small troublesome flakes.

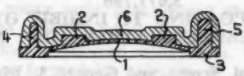
3,677,791
METHOD OF DEPOSITING VITREOUS MATERIAL ON A FACEPLATE PANEL
Kazimir Palac, Carpentersville, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed July 6, 1970, Ser. No. 52,324
Int. Cl. B44d *5/06*
U.S. Cl. 117—33.5 CM **4 Claims**

A faceplate panel for a cathode ray tube is positioned so that its natural curvature forms a shallow container for a wet solution. A wet solution of photosensitive vitreous slurry is poured onto the internal surface of the faceplate panel and assumes a stable fluid level. The photosensitive vitreous slurry is then exposed to an even dispersion of ultraviolet light from the opposite side of the faceplate panel to photodeposit the suspended vitreous material therein on the internal surface, firstly immediately adjacent the internal surface and then successively inward therefrom until the desired thickness is obtained. The deposited vitreous material then constitutes a dark surround for a color image screen and can be suitably etched to contain apertures therein to allow phosphor dots to be positioned adjacent the internal surface of the panel. After etching the apertures in a predetermined pattern, the panel is then flooded with a photosensitive phosphor slurry of a selected color and exposed to the ultraviolet light source to deposit the suspended phosphor in the apertures.

3,677,792
METHOD OF PRODUCING COATED VACUUM METALLIZED ARTICLES
William J. Best, Union Lake, Mich., assignor to Michael Ladney, Jr., Grosse Pointe Shores, Mich.
No Drawing. Continuation-in-part of application Ser. No. 452,849, May 3, 1965. This application June 8, 1970, Ser. No. 44,663
Int. Cl. G02b *17/00*
U.S. Cl. 117—35 V **10 Claims**

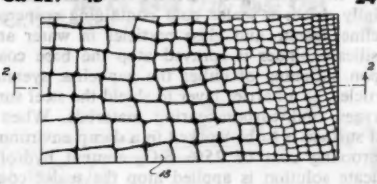
A method of vacuum metallizing an article for decorative purposes involving the conventional steps of applying to the article a base coat, a vacuum metallized film over the base coat and a first top coat over the vacuum metallized film and also including the additional step of applying over the first top coat a second top coat of a film-forming, liquid organic material having greater durability than the first top coat and adapted to adhere to the first top coat and be compatible therewith.

3,677,793
METHOD FOR PRODUCING DIALS
Walter Blösch, Grenchen, Switzerland, assignor to Liss S.A., Grenchen, Switzerland
Filed Feb. 6, 1970, Ser. No. 9,326
Claims priority, application Switzerland, Feb. 17, 1969, 2,340/69
Int. Cl. B44d *3/30*; B32b *31/00*
U.S. Cl. 117—38 **10 Claims**



A method for producing dials having hour symbols coated with a metal other than the metal coating the dial ground or plate, wherein masks are formed on master dials and applied to dials to be produced whereafter said metal is vapour deposited on said hour symbols.

3,677,794
TEXTURED ARTICLES AND PROCESS FOR PREPARING SAME
William C. Jeff, Basking Ridge, and Thomas Luyster, Jr., Saddle Brook, N.J., James F. Lynch, Jr., Schaumberg, Ill., and Frank A. Moroll, Clark, N.J., assignors to John L. Armitage and Co., Newark, N.J.
Continuation of application Ser. No. 460,216, June 1, 1965. This application Apr. 23, 1970, Ser. No. 31,339
Int. Cl. B44d *1/14, 1/16*
U.S. Cl. 117—45 **24 Claims**



A novel method for forming textured coatings and the resulting novel textured articles are taught. The method involves forming a discontinuous patterned, ink layer either directly on the surface of a form-retaining member such as plastic, metal, etc., or on a base layer applied to said surface, and then applying a top layer of resinous, film-forming material thereover.

3,677,795

METHOD OF MAKING A PROSTHETIC DEVICE

Jack C. Bokros, San Diego, and Willard H. Ellis, Leucadia, Calif., assignors to Gulf Oil Corporation, San Diego, Calif.

No Drawing. Continuation-in-part of application Ser. No. 649,811, June 29, 1967. This application May 1, 1969, Ser. No. 821,080

Int. Cl. C01b *31/00*; C23c *11/00*

U.S. Cl. 117—46 CG 14 Claims

This is a method for making a prosthetic device for implantation in a living body. The method comprises the steps of forming a substrate of a material stable at temperature of at least about 1350° C., heating said substrate together with particulate material to provide additional deposition surface area to a temperature of between about 1350° C. and about 1600° C. in a reaction chamber, flowing a mixture of propane or butane and an inert gas through said reaction chamber at atmospheric pressure, said propane or butane constituting between about 15 volume percent and about 40 volume percent of said mixture, so that said substrate becomes coated with isotropic pyrolytic carbon having a BAF between 1.0 and 2.0, having an apparent crystallite size of about 50 A. or less and having a density of at least about 1.5 grams per $cm.^3$, and continuing said gas flow until the thickness of said isotropic carbon deposit is at least about 50 microns, whereby a device is produced which has excellent compatibility with body tissue and is nonthrombogenic. If desired, the hydrocarbon gas mixture may contain a carbide-forming element selected from the group consisting of silicon, zirconium, titanium, tantalum, boron, tungsten, niobium, vanadium, molybdenum, aluminum, or hafnium.

3,677,796

PROTECTIVE COATING TO INHIBIT OXIDATION AND/OR CARBURIZATION OF METALLIC SURFACES

Roland T. Girard, Scotia, and George A. Rice, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Continuation of application Ser. No. 663,966, Aug. 29, 1967. This application May 27, 1970, Ser. No. 41,118

Int. Cl. B44d *1/16*

U.S. Cl. 117—70 A 5 Claims

Oxidation and carburization of steel surfaces heated to elevated temperatures above 600° C. are inhibited by a protective coating containing at least 10% fusible materials to shield, upon softening, the steel surface from deteriorating agents and at least 20% sacrificial metal particles to react with carbonaceous materials penetrating the protective shield formed by the softened fusible materials. The protective coating preferably is applied in dual layers with the base coat for a machined steel surface generally comprising a suspension of iron particles and a soluble silicate binder to adhere a spray application of the base coat to the machined steel surface. After the base coat has partially dried, a sealer coat containing suspensions of nepheline syenite and glass particles in water and a sodium silicate binder is sprayed atop the base coat to serve, upon softening of either the nepheline syenite or glass particles, as a barrier layer to shield the steel surface from oxygen and carbon-bearing materials. When the protected surface is to be worked in a damp environment, a waterproofing coat of 25% SiO_2 content hydrolyzed ethyl silicate solution is applied atop the sealer coat. A mixture of the base coat and the sealer coat provides protection against pitting of a steel surface located in a dry environment with a single application of the protective coating while the incorporation of a suitable carbonate, hydroxide, oxide or fluoride into either the sealer coat or the mixture of the base coat and the sealer coat eliminates the need for a separate waterproofing coat when the alloy is heat worked in a damp environment.

3,677,797

METHOD OF FORMING CORROSION RESISTANT FILMS ON STEEL PLATES

Hidejiro Asano and Yashichi Ouyagi, Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

No Drawing. Filed Apr. 27, 1970, Ser. No. 32,439

Int. Cl. C23c *3/04*; C23f *17/00*

U.S. Cl. 117—71 M 15 Claims

A process for producing a surface-treated steel plate high in the anticorrosiveness, particularly adapted as a material for making cans, on the principle of the thermodecomposing plating, wherein the steel plate is coated with an aqueous solution containing nitrate and/or acetate of Ni as the main component thereof and of other metals such as Cr, Mn, Zn and Al as selective components and then heated at a certain range of temperature so as to cause the thermodecomposing reaction to cause thereby a strong film containing metallic nickel and at least one metal oxide to form on the surface of the steel plate.

3,677,798

POLYMERIC CHROMIUM SULFATOZIRCONATE COMPOSITIONS, THEIR PREPARATION AND USE

Warren B. Blumenthal, North Tonawanda, N.Y., assignor to N L Industries, Inc., New York, N.Y.

No Drawing. Original application Apr. 19, 1967, Ser. No. 631,906, now Patent No. 3,540,839. Divided and this application Nov. 12, 1970, Ser. No. 89,148

Int. Cl. B44d *1/14*

U.S. Cl. 117—62.1 9 Claims

Polymeric chromium sulfatozirconates are produced by reduction of chromium compounds such as alkali metal dichromates in sulfuric acid to form chromic sulfate, reacting said sulfate with an acid soluble zirconium compound, and heating the reaction product to at least about 80° C. Organic fibrous webs and glass surfaces are rendered water-repellent by forming thereon adsorbates by reaction of the sulfatozirconates with alkali metal soaps of fatty acids.

3,677,799

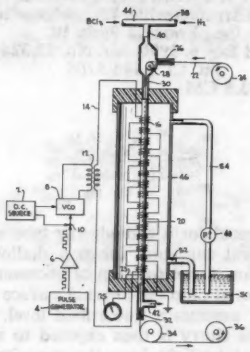
VAPOR PHASE BORON DEPOSITION BY PULSE DISCHARGE

Kenneth C. Hou, Whippany, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 10, 1970, Ser. No. 88,358

Int. Cl. C23c *13/00*

U.S. Cl. 117—93.1 R 17 Claims



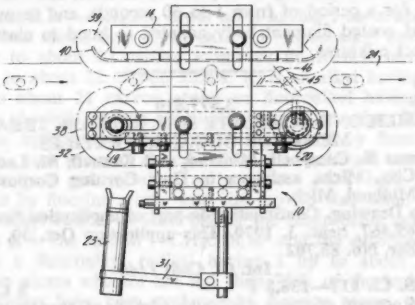
A process is provided for the low temperature deposition of a boron coating upon a substrate comprising providing a gaseous mixture of hydrogen and a boron compound in a coating zone containing the substrate and applying sufficient high frequency electrical energy to the

zone in pulsed form to establish a boron-hydrogen excited gas species therein capable of imparting the desired boron coating to the substrate.

3,677,800
ANTI-THROMBOGENIC COATINGS AND PRODUCTS
Archibald N. Wright, Schenectady, N.Y., assignor to General Electric Company
No Drawing. Filed Mar. 18, 1970, Ser. No. 20,816
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 **6 Claims**

A thin, continuous adherent coating is formed on a substrate by ultraviolet surface photopolymerization of sodium heparin in the gaseous phase. The resulting coated article exhibits anti-thrombogenic behavior and is suitable for prosthetic use.

3,677,801
METHOD OF COATING IRREGULAR OBJECTS
Donald F. Hardy, Horseheads, N.Y., assignor to Dart Industries, Inc., Los Angeles, Calif.
Continuation-in-part of application Ser. No. 820,529, Apr. 30, 1969. This application July 28, 1970, Ser. No. 62,217
Int. Cl. B44d *1/20*
U.S. Cl. 117—94 **3 Claims**



A process and apparatus for coating an article having an irregular cross section. The apparatus comprises at least one belt having a polyurethane foam layer having a coating surface and a second foam layer having a second coating surface said surfaces facing each other and being spaced at a distance sufficient to permit both surfaces to coat the article, the combined thickness of said foam layers being thick enough to deform and cause said surfaces to conform to at least a portion of the surface of the article. In the process the article is conveyed to the coating surfaces of the apparatus. The belt then engages the surface of the article and transports it through the apparatus. The foam surface of the belt is supplied with coating material and the belt transfers the coating material to the article being coated.

3,677,802
PROCESS FOR STRONG, DURABLE PRESS FABRICS
Richard N. Knowles, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Mar. 23, 1970, Ser. No. 22,029
Int. Cl. B44d *1/092*
U.S. Cl. 117—56 **12 Claims**

Durable press cellulosic fabrics with good tensile strength and abrasion resistance are prepared by treating the fabric with a solution of a polyisocyanate such as bis - (4 - isocyanatocyclohexyl)methane in an organic swelling solvent such as dimethyl sulfoxide and curing the fabric prior to the pad-dry-cure durable press treatment.

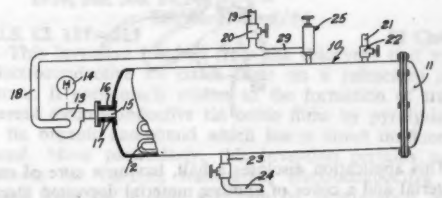
3,677,803
ANTISEIZE THREAD COMPOSITION
Frank W. Bennett and Loren S. Van Delinder, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.
No Drawing. Original application Aug. 30, 1968, Ser. No. 756,355. Divided and this application Mar. 5, 1971, Ser. No. 121,534
Int. Cl. B44d *5/00, 5/08*
U.S. Cl. 117—94 **11 Claims**

An antiseize composition comprising finely divided pulverized chrysotile asbestos and a carrier therefor. There is also provided a process for treating metallic securing assemblies of the type wherein a metallic securing member such as a stainless steel bolt threadably engages a fastening element such as a stainless steel nut to prevent seizure of the fastening element to the securing member at the site of threadable engagement which comprises applying the novel antiseize material to the portions to be in threadable engagement.

3,677,804
MOLDABLE NEEDLE-LIKE ASSEMBLIES
Ilmar L. Kalnin, Millington, and George J. Breckenridge, Roselle, N.J., assignors to Celanese Corporation, New York, N.Y.
No Drawing. Filed Sept. 19, 1969, Ser. No. 859,458
Int. Cl. B44d *1/20*
U.S. Cl. 117—100 A **13 Claims**

Moldable epoxy resin impregnated fibrous needle-like assemblies are provided which may be utilized in the production of fiber reinforced composites. The needle-like assemblies are formed by agitating at an elevated temperature a minor quantity of discontinuous fibers with an emulsion comprising a minor quantity of an A-stage epoxy resin and a curing agent for said epoxy resin within a major quantity of a continuous phase comprising a mixture of glycerol, water, and a water-soluble nonionic surface-active agent. The product of the present invention is recovered from the system in which is formed and is suitable for use as a granular moldable material which consists of essentially unidirectionally aligned fibers impregnated with a B-stage epoxy resin.

3,677,805
METHOD FOR IMPREGNATING WOOD
Jackson Herman Barnett, Jr., 84 N. Crest Road, Chattanooga, Tenn. 37405
Filed Mar. 4, 1970, Ser. No. 16,277
Int. Cl. B44d *1/26;* B05c *3/05*
U.S. Cl. 117—102 A **4 Claims**



Method for impregnating wood with a treating liquid such as a preservative, a fire retardant or the like, wherein

the wood is immersed in the treating liquid inside a pressure vessel. The pressure in the vessel is brought up to operating pressure within a short time, on the order of ten minutes or less, and the contents of the vessel are then subjected to the action of a pulsating pump which provides sinusodial pressure pulses within the vessel having a positive peak to negative peak amplitude of from 1 to 1500 pounds per square inch. These pressure pulses are modulated by the action of a pressure relief means associated with the pressure vessel, whereby the resultant pressure acting on the wood being impregnated consists of a series of pressure pulses modulated in amplitude at a relatively slow rate. The treating liquid which is discharged through the pressure relief means in a pulsating fashion is then recycled back to the pulsating pump so that there is a substantially continuous flow of treating liquid from the pump, through the pressure vessel, through the pressure relief means, and finally back into the inlet end of the pump.

3,677,806

PROCESS FOR MAKING TOBACCO SMOKE FILTERS

Joachim Raban, Borgfelde 26b, D2000 Hamburg-Schenefeld, Germany; Ewald Erxleben, Hegholt 79f, D2000 Hamburg-Bramfeld, Germany; and Wolfgang Wildenau, Georg-Bonne-Str. 33, D2000 Hamburg, Germany

Continuation-in-part of application Ser. No. 798,637, Feb. 12, 1969. This application May 6, 1970, Ser. No. 35,172

Claims priority, application Germany, May 6, 1969, P 19 23 113.1

Int. Cl. B44d *1/30, 1/08*

U.S. Cl. 117—104 R **11 Claims**

The quantity of plasticizer added to cellulose acetate filter fibers is controlled by adding an indicator substance to the plasticizer, the indicator substance having different infrared absorption characteristics to those of the cellulose acetate, and measuring the infrared reflexion of the plasticizer-indicator mixture.

3,677,807

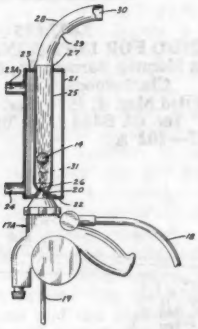
METHOD OF MAKING BEARING BALLS

Richard S. Curtis, 7887 Jackson Road, Ann Arbor, Mich. 48104. and Rodger E. Allen, 4203 W. 111th St., Inglewood, Calif. 90301

Filed Sept. 29, 1969, Ser. No. 870,314

Int. Cl. B44d *1/08;* C23c *7/00*

U.S. Cl. 117—105 **1 Claim**



This application discloses a ball, having a core of one material and a cover of another material deposited thereon, and the method of making it. The invention resides in the particular combination and arrangement of the components of the ball and in the process of manufacturing it.

3,677,808

METHOD OF MANUFACTURING CONSOLIDATED ARTICLES BY THE USE OF STEAM ATOMIZED WAX

John L. Sheridan, Longview, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

No Drawing. Filed Oct. 21, 1970, Ser. No. 82,865

Int. Cl. B44d *1/09*

U.S. Cl. 117—105.3 **17 Claims**

Steam is employed to atomize molten wax used as a waterproofing agent in the manufacture of composite, consolidated articles from particulate materials such as particulate wood and gypsum.

3,677,809

PROCESS FOR THE COATING OF FILAMENT BODIES WITH AN ADHESIVE FOR METAL AND RUBBER

Günter Klement, Dusseldorf-Holthausen, Germany, assignor to Henkel & Cie GmbH, Dusseldorf, Germany

No Drawing. Filed Nov. 12, 1969, Ser. No. 876,085

Claims priority, application Germany, Nov. 28, 1968, P 18 11 467.5

Int. Cl. B44d *1/42, 1/48;* C03c *25/02*

U.S. Cl. 117—119.6 **8 Claims**

A process for the coating of filament bodies with organic adhesives for metal and rubber which consists essentially of the steps of applying a coating of an organic adhesive for metal and rubber in dissolved or dispersed form in an organic solvent to a filament body of small diameter, passing said coated filament body through a heated zone having a temperature of from 225° to 500° C. for a period of from 1 to 60 seconds, and recovering said coated filament body adapted to bond to elastomer stock mixtures.

3,677,810

SILICONE-ACRYLATE SOIL RELEASE TREATMENT FOR ORGANIC TEXTILES

James K. Campbell, Midland, and Kenneth M. Lee, Bay City, Mich., assignors to Dow Corning Corporation, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 69,467, Sept. 3, 1970. This application Oct. 30, 1970, Ser. No. 85,702

Int. Cl. C08j *1/40*

U.S. Cl. 117—138.8 F **8 Claims**

Removal of stains during laundering of organic textiles is facilitated and superior hand is imparted to the fabric by applying thereto a combination of from 10 to 99% by weight of a polymethylsiloxane and from 1 to 90% by weight of a polymeric, unsaturated, water-soluble carboxylic acid. This combination works especially well in combination with aminoplast crease resistance textile resins. A typical formulation is 45% by weight of dihydroxyl dimethylolethylene urea resin, 27.5% by weight of a polydimethylsiloxane of 50,000 cs. viscosity and 27.5% by weight of polymethacrylic acid.

3,677,811

ANTISTATIC THERMOPLASTIC POLYMER FILM

John Alan Elliott Kail, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

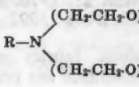
No Drawing. Filed Sept. 22, 1969, Ser. No. 860,031

Claims priority, application Great Britain, Oct. 1, 1968, 46,530/68

Int. Cl. C08f *3/08, 45/00*

U.S. Cl. 117—138.8 E **7 Claims**

Antistatic composition comprising a mixture of a compound of the formula



wherein the sum of x and y has a value from 2 to 5 inclusive and R is a monovalent aliphatic radical having from 12 to 22 carbon atoms and one or more glycerides, and the use of these compositions for rendering films antistatic either by incorporating in the film or coating onto the film.

3,677,812

OIL REPELLANT FIBROUS MATERIALS AND PREPARATION THEREOF

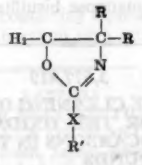
Domenick Donald Gagliardi, East Greenwich, R.I., assignor to Commercial Solvents Corporation, New York, N.Y.

No Drawing. Original application Dec. 12, 1966, Ser. No. 600,713. Divided and this application Feb. 12, 1969, Ser. No. 871,150

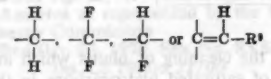
Int. Cl. C08j *1/44*; D06m *15/16*

U.S. Cl. 117—139.5 A **9 Claims**

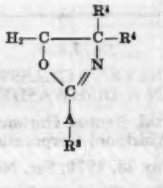
The present invention is directed to the use of compositions of matter having the formula



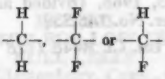
wherein R is —CH_2OH, lower alkyl having 1 up to about 3 carbon atoms or —CH_2OOCR^2, R^2 is an alkyl having 1 up to about 22 carbon atoms or fluoroalkyl having 1 up to about 22 carbon atoms; R′ is an alkyl having 1 up to about 21 carbon atoms or fluoroalkyl having 1 up to about 21 carbon atoms wherein not less than 75% of the hydrogen atoms have been replaced by fluorine atoms, and wherein at least 2 of the hydrogen atoms on at least one terminal carbon atom have been replaced by fluorine atoms with the proviso that when R′ is an alkyl radical at least one of the substituents designated R is the radical —CH_2OOCR^2 and the substituent R^2 is a fluoroalkyl radical having 1 up to about 22 carbon atoms wherein not less than 75% of the hydrogen atoms have been replaced by fluorine atoms, and wherein at least 2 of the hydrogen atoms on at least one terminal carbon atom have been replaced by fluorine atoms; and X is a divalent radical such as



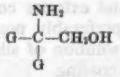
wherein R^9 is hydrogen, alkyl or aryl, to provide oil-repellent fibrous materials. It is also directed to a method for the preparation of oil-repellent fibrous materials from compositions of the formula



wherein R^3 is a fluoroalkyl radical having 1 up to about 21 carbon atoms wherein not less than 75% of the hydrogen atoms have been replaced by fluorine atoms and wherein at least 2 of the hydrogen atoms on at least one terminal carbon atom have been replaced by fluorine atoms; R^4 is —CH_2OH, lower alkyl having 1 up to about 3 carbon atoms or —CH_2OOCR^5; R^5 is a fluoroalkyl radical having from about 2 to about 22 carbon atoms wherein not less than 75% of the hydrogen atoms have been replaced by fluorine atoms, and wherein at least 2 of the hydrogen atoms on at least one terminal carbon atom have been replaced by fluorine atoms; and A is



by reacting an amino alcohol of the formula



wherein G is lower alkyl having 1 up to about 3 carbon atoms or —CH_2OH with a fluoroalkylmonocarboxylic acid having from about 3 to about 23 carbon atoms wherein not less than 75% of the hydrogen atoms have been replaced by fluorine atoms and wherein at least 2 of the hydrogen atoms on at least one terminal carbon atom have been replaced by fluorine atoms.

3,677,813

PROCESS FOR DRESSING LEATHER AND THE DRESSED LEATHER

Guenter Eckert, Limburgerhof, Matthias Marx, Bad Duerkheim, Heinrich Hartmann, Limburgerhof, and Lothar Wuertele, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Dec. 17, 1969, Ser. No. 886,043

Int. Cl. B44d *1/32*; C14c *9/00*

U.S. Cl. 117—142 **12 Claims**

Process for dressing leather and synthetic leather substitutes by applying to the leather a composition comprising

(a) a copolymer carrying acetyl acetate groups or cyano acetate groups, in the form of a solution or dispersion in an organic liquid, and

(b) one or more aldehydes or a compound capable of dissociating to give an aldehyde,

and drying the coating. The resulting dressing is waterproof and resitsant to solvents.

3,677,814

PROCESS FOR FORMING ELECTROCONDUCTIVE TIN OXIDE FILMS BY PYROLYZATION OF ALKYL AND ARYL TIN FLUORIDES

Frank H. Gillery, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation of application Ser. No. 701,098, Jan. 29, 1968. This application Oct. 26, 1970, Ser. No. 84,240

Int. Cl. H05b *3/14*

U.S. Cl. 117—211 **11 Claims**

This invention resulted from the discovery that prior electroconductive tin oxide films on a refractory substrate. It particularly relates to the formation of transparent electroconductive tin oxide films by pyrolysis of a tin organic compound which has a direct tin-fluoride bond. More particularly, this invention pertains to a process for forming transparent electroconductive tin oxide films on a glass substrate by pyrolyzation of a solution containing organic tin fluorides which have a direct tin-fluoride bond, especially solutions of alkyl tin polyfluorides such as dialkyl tin difluorides.

3,677,815

METHOD OF MAKING AN ELECTROLYTIC ANODE

Carl D. Keith, Summit, Alfred J. Haley, Jr., Florham Park, and Robert M. Kero, Cranford, N.J., assignors to Engelhard Minerals & Chemicals Corporation

No Drawing. Application Nov. 28, 1969, Ser. No. 880,932, which is a continuation-in-part of application Ser. No. 786,438, Dec. 23, 1968. Divided and this application May 20, 1971, Ser. No. 145,539

Int. Cl. B44d *1/18*

U.S. Cl. 117—215 4 Claims

An improved anode for the electrolysis of brines, comprised of a corrosion resistant valve metal substrate, a thin porous adherent exterior coating of silica, and between the substrate and exterior coating a thin layer of ruthenium oxide, is preferably prepared by applying a hydrophilic colloidal solution of silica on the ruthenium oxide and firing the coating.

3,677,816

METHOD FOR MAKING ELECTRICALLY CONDUCTIVE LAYER OF COPPER IODIDE

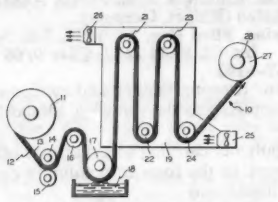
Yoshiki Hayashi, Hiromi Sasaki, and Toichi Matsumura, Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 22, 1968, Ser. No. 769,680

Claims priority, application Japan, Oct. 26, 1967, 42/70,048

Int. Cl. B44d *1/18*

U.S. Cl. 117—217 5 Claims



A transparent and electrically conducting coating is provided on a surface of a solid inert insulating substrate by exposing said surface to an atmosphere of copper metal vapor so as to form a thin layer of copper metal thereon and then contacting the said thin layer of copper metal with an iodine-containing solution so as to convert the thin layer of copper metal into a thin layer of copper iodide. Means for carrying out the method above described are set forth.

3,677,817

NOVEL PRESSURE-SENSITIVE TRANSFER SHEET

Richard L. Muri, Ashland, and Thomas D. Vere, Newton, Mass., assignors to Ludlow Corporation, Needham Heights, Mass.

No Drawing. Filed Feb. 24, 1970, Ser. No. 13,866

Int. Cl. H01f *10/02*

U.S. Cl. 117—235 10 Claims

A novel transfer sheet which is especially valuable for use in transferring images onto bank checks and like forms which are intended to be identified by automatic reading equipment. The sheet has a single coating layer comprising particles of a sensible pigment and a slightly-plasticized wax. These particles are held in a relatively weak, primarily cellulosic binder system. The wax particles are advantageously below about 2 microns in average diameter.

3,677,818

PROCESSES FOR PREPARING MANNOSE AND MANNOSE DERIVATIVES

Ronald L. Casebier, Franklin W. Herrick, and Kenneth R. Gray, Shelton, and Frederic A. Johnston, Aberdeen, Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

No Drawing. Filed Apr. 2, 1970, Ser. No. 25,257

Int. Cl. C13k *9/00*

U.S. Cl. 127—46 R 60 Claims

Methods for preferentially crystallizing mannose bisulfite adducts from aqueous mannose-containing solutions. These mannose adducts can be recovered in pure form. Also methods for regenerating substantially pure mannose from the mannose bisulfite adducts.

3,677,819

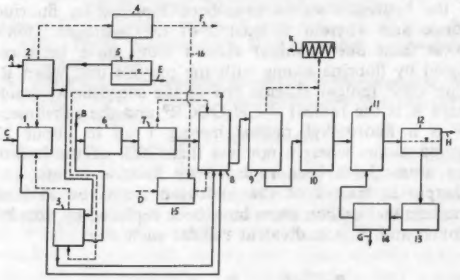
PROCESS FOR THE CLEANING OF PLANTS WHICH ARE USED FOR THE OXIDATION OF SATURATED HYDROCARBONS IN THE PRESENCE OF BORON COMPOUNDS

Reinhard Thiel and Gunther Ellendt, Krefeld-Bockum, Germany, assignors to Halcon International, Inc.

Filed Mar. 17, 1970, Ser. No. 20,379

Int. Cl. B08b *9/00*

U.S. Cl. 134—2 3 Claims



Process for the cleaning of plants which are used for the oxidation of saturated hydrocarbons in the presence of boron compounds by rinsing, which is characterized by treating equipment and lines of the plant with alcohol-containing solutions at elevated temperature under exclusion of oxygen from the air and if necessary at elevated pressure and/or by passing inert gas through.

3,677,820

METHOD TO PREVENT GLASSWARE ETCHING IN A DISHWASHER

Beverly J. Rutkowski, Benton Harbor, Mich., assignor to Whirlpool Corporation

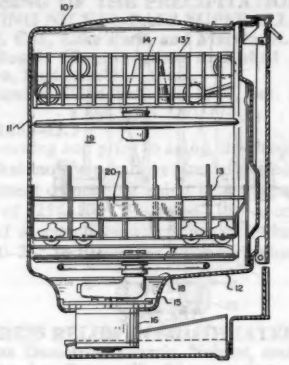
Filed May 28, 1970, Ser. No. 41,186

Int. Cl. A47l *15/00*; B08b *3/02*

U.S. Cl. 134—25 A 8 Claims

A method of and apparatus for substantially preventing corrosion of glassware during washing thereof with a corrosion producing detergent solution in a mechanical dish-

washer of the household type in which an alkaline detergent solution contacts the glassware for cleaning thereof



while simultaneously contacting a piece of metal comprising either zinc or magnesium or a mixture thereof.

3,677,821

METHOD FOR RECONDITIONING THE SURFACE OF PLASTICS

Ryohei Tanaka, Chiba-shi, Japan, assignor to Lion Fat & Oil Co., Ltd., Tokyo, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 785,784, Dec. 20, 1968. This application Nov. 12, 1970, Ser. No. 89,085

Claims priority, application Japan, Dec. 29, 1967, 43/84,926

Int. Cl. B08b *7/00*

U.S. Cl. 134—42 **9 Claims**

A method for reconditioning the stained or discolored surfaces of plastic objects to substantially restore them to their original condition which comprises the steps of treating the surface of a plastic object with an aqueous solution of chlorine-containing bleaching agent having a pH or more than 5, then treating the surface thereof with an aqueous solution of sulfur-containing bleaching agent having a pH of more than 5, and thereafter rinsing the surface with water.

3,677,822

THERMAL BATTERY HAVING A THERMAL RESERVOIR PELLET

Donald M. Bush, Tijeras, N. Mex., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 23, 1970, Ser. No. 83,582

Int. Cl. H01m *21/00*

U.S. Cl. 136—83 T **10 Claims**

A thermal battery having heat generating means forming a part of stacked cells of the battery and acting to fuze an electrolyte to activate the battery and including a thermal reservoir means near the ends of the cell stack for absorbing heat from the heat generating means during combustion thereof and for thereafter releasing heat to the cell stack. Elements of the battery cell stack are formed as pellets or discs which retain shape during operation and are stacked in an assembly which reduces battery variations during operation.

3,677,823

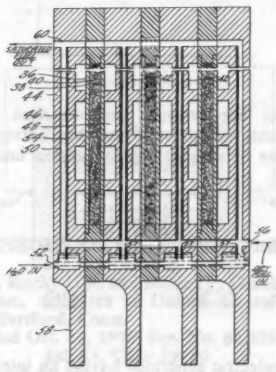
FUEL SATURATOR FOR LOW TEMPERATURE FUEL CELLS

John C. Trocciola, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 6, 1969, Ser. No. 863,944

Int. Cl. H01m *27/14*

U.S. Cl. 136—86 C **8 Claims**



Fuel cell waste heat supplies the energy to saturate a dry fuel gas supply stream with water vapor. The fuel saturator may be featured as an integral component of the fuel cell stack. The mixture is directed to a reformer where the fuel is steam reformed to produce a hydrogen rich stream which is utilized as the fuel for the electrochemical reactions occurring within the fuel stack.

3,677,824

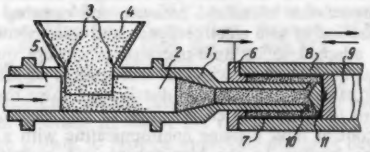
ARRANGEMENT FOR MANUFACTURE OF A PRIMARY CELL ELECTRODE

Faat Khatovich Nabiullin, 3 Mytischinskaya ul. 14–a, kv. 90; Zoya Mikhailovna Buzova, Suschevsky val. 23, kv. 116; Efim Mikhailovich Gertsik, 3 Mytischinskaya ul. 14–a, kv. 98; and Sergei Alexeevich Zjuzin, Vseslavinskaya ul. 8, kv. 76, all of Moscow, U.S.S.R.

Continuation of abandoned application Ser. No. 806,476, Mar. 12, 1969. This application Mar. 1, 1971, Ser. No. 119,935

Int. Cl. H01m *21/06*

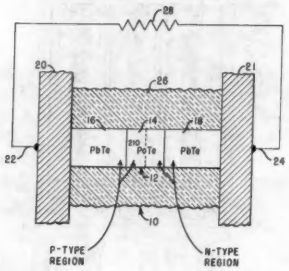
U.S. Cl. 136—175 **5 Claims**



A device for the manufacture of a primary cell electrode wherein a primary cell casing its placed in a female die

whose bottom is constituted by an ejector, and said casing in conjunction with a retaining washer, which defines the position and shape of the top end of the electrodes, and a stem having a central duct and introduced into said primary cell casing, form a closed tubular chamber, provision being made in the portion of said stem within said tubular chamber for channels, which channels originate in the central duct of said stem, pass through the walls of said stem, and terminate in said tubular chamber.

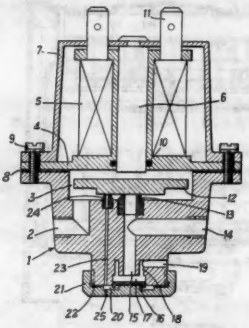
3,677,825
THERMOELECTRIC GENERATOR
Le Conte Cathey, Columbia, S.C., assignor to the United States of America as represented by the United States Atomic Energy Commission
Filed Oct. 30, 1968, Ser. No. 772,074
Int. Cl. G21d 7/00
U.S. Cl. 136—202 **6 Claims**



A thermoelectric generator having an integral radioisotope heat source-thermoelectric converter element. The heat source is disposed in intimate contact between thermoelectric converter legs and is fabricated from a compound that on radioactive decay is converted to the same compound as the thermoelectric converter material. A suitable heat source material is polonium-210, in the form of PoTe, that converts on decay to lead-206, in the form of PbTe, so that the thermoelectric converter legs are fabricated from compatible PbTe. The latter compound is suitably doped to provide the desired semiconductor characteristics.

3,677,826
THREE-WAY SOLENOID-OPERATED VALVES
Rene Pointout, 37 Rue Saint Jean; and Jacques Rouvet, 9 Rue des Plantes, both of Montlucon, France; and Adolphe Joliot, 43 Rue de Lisbonne, Paris, France
Filed Dec. 28, 1970, Ser. No. 101,463
Int. Cl. F16k 31/06
U.S. Cl. 137—596.16 **10 Claims**

A three-way solenoid-operated valve for distributing a fluid under pressure, simple in construction, requiring no adjustment and being highly reliable, comprising independent distributing valve and exhaust valve members, said distributing valve member closing a distributing passage under the inlet fluid pressure and opening it upon energization of said electromagnet, and said exhaust valve being adapted to be fluid-operated to closure through a control fluid passage, which is independent of said distributing passage and that said distributing valve member is adapted to open upon energization of said electromagnet, said control fluid passage communicating with a leakage passage leading to the atmosphere and permitting the opening of said exhaust valve member when said electromagnetic is de-energized, as a consequence of the closing of said control fluid passage by said distributing valve member. Said leakage passage may be formed in the magnetic circuit of the electromagnet so as to be closed by a



valve plunger when said electromagnet is energized to feed a load apparatus.

3,677,827
COMPOSITION AND METHOD FOR BLACKENING METAL ARTICLES
Roger Weaver, Decatur, and Eugene Schaffstall, Chamblee, Ga., assignors to Oxford Chemicals
No Drawing. Filed Sept. 9, 1969, Ser. No. 856,481
Int. Cl. C23f 7/04
U.S. Cl. 148—6.14 R **11 Claims**

A composition for producing black oxide coatings on ferrous metals comprising a liquid mixture of sodium hydroxide, sodium nitrate, sodium nitrite, and water is improved by the addition of triethanolamine or other iron sequestrants.

3,677,828
TARNISH RESISTANT COPPER AND COPPER ALLOYS
Elmer J. Caule, New Haven, Conn., assignor to Olin Corporation
No Drawing. Filed July 30, 1970, Ser. No. 59,684
Int. Cl. C23f 7/08
U.S. Cl. 148—6.15 R **14 Claims**

A method of producing a laminate having high bond strength and excellent resistance to acid undercutting comprising oxidizing copper or its alloys to form an oxide film, applying a phosphoric acid solution to the oxide film, rinsing, drying, and adhesively laminating to a plastic film. The instant case also teaches a method of producing high tarnish resistance on copper and its alloys by so oxidizing and phosphating and further teaches a flexible printed circuit wherein the unwanted copper portion of the formed laminate is etched away, characterized by high peel strength and substantially no acid undercutting of the formed circuitry.

3,677,829
PROCESS FOR THE BLUING OF STEEL SURFACES
David Stefanye, 12005 Gregerscroft Road, Potomac, Md. 20854
No Drawing. Filed Sept. 18, 1970, Ser. No. 73,581
Int. Cl. C23f 7/04
U.S. Cl. 148—6.35 **7 Claims**

Steel surfaces can be colored to any desired hue between a light violet-blue and a deep blue-black by suspending the part in the effluent vapors obtained by boiling any organic compound selected from the group in which the boiling temperature thereof lies between 305° C. and 360° C., the coloring attained varying from the lighter to the darker hues in accordance with the extent to which the boiling point temperature of the selected organic compound exceeds the minimum.

3,677,830

PROCESSING OF THE PRECIPITATION HARDENING NICKEL-BASE SUPERALLOYS

Arthur R. Cox, Lake Park, and Marvin M. Allen, North Palm Beach, Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

No Drawing. Filed Feb. 26, 1970, Ser. No. 14,678
Int. Cl. C22f 1/18
U.S. Cl. 148—12.7 3 Claims

After working and prior to aging, the precipitation hardening nickel-base superalloys are subjected to a duplex heat treatment comprising a first heat treatment at a temperature of 25°–100° F. below the secondary phase solvus and a second heat treatment in the temperature range of 0–25° F. below the secondary phase solvus.

3,677,831

STRESS RELIEF IN SOLID MATERIALS

Constantine Demetrius Pezaris, Nahant, and Theophanes G. Pantazelos, Somerville, Mass., assignors to Lodding Engineering Corporation, Auburn, Mass.

Filed May 14, 1970, Ser. No. 37,127
Int. Cl. C21d 1/04
U.S. Cl. 148—12.9 6 Claims

A method and apparatus are disclosed for relieving stress in solid materials. Vibrations are applied to a workpiece, which are varied through a given frequency range in a specific time interval according to a reproducible pattern, and signals which sample a reaction of the workpiece to the vibrations are recorded along the path or paths of a point or points being displaced with respect to time in synchronism with the reproducible pattern.

3,677,832

NITRIDED TITANIUM ALLOYS

Ray J. Van Thyne, Oak Lawn, and John J. Rausch, Antioch, Ill., assignors to Surface Technology Corporation, Stone Park, Ill.

No Drawing. Filed Mar. 4, 1970, Ser. No. 16,572
Int. Cl. C22c 27/00; C23c 11/14
U.S. Cl. 148—31.5 7 Claims

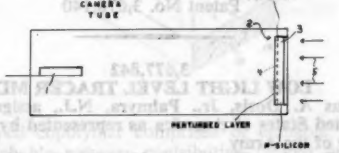
A novel group of nitrided alloys having excellent wear and abrasion resistance and utility as cutting tool materials containing (a) titanium, (b) one or more metals of the group vanadium, columbium, or tantalum, and (c) molybdenum or tungsten. The alloys can be readily fabricated to shape and then hardened by nitriding to produce high surface hardness.

3,677,833

CAMERA TUBE TARGETS

Daniel Le Coq, Rueil-Malmaison, France, assignor to North American Philips Company Inc., New York, N.Y.

Continuation of application Ser. No. 647,959, June 22, 1967. This application Dec. 9, 1969, Ser. No. 880,473
Int. Cl. H01j 29/45, 31/38
U.S. Cl. 148—33.2 5 Claims



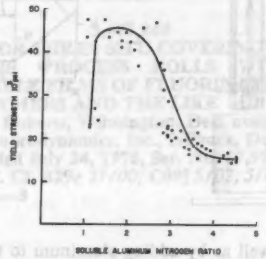
A photosensitive target for a camera tube comprising a slice of n-type silicon having adjacent one face a shallow junction produced by creating voids in the crystal lattice. This may be accomplished by polishing with a fine abrasive, or by bombardment with subatomic particles.

3,677,834

NITRIDE STRENGTHENED STEEL

Edward H. Mayer and Evan M. Oliver, Bethlehem, Pa., assignors to Bethlehem Steel Corporation

Continuation-in-part of application Ser. No. 732,448, May 27, 1968, which is a continuation-in-part of application Ser. No. 538,872, Mar. 30, 1966, both now abandoned. This application Aug. 13, 1970, Ser. No. 63,454
Int. Cl. C21d 9/48; C22c 39/02
U.S. Cl. 148—36 4 Claims



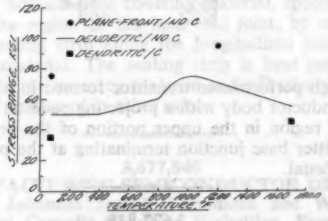
Aluminum and nitrogen improve the load-carrying ability of decarburized steel sheets after straining up to about 20% and annealing by exposure to enamel firing temperatures.

3,677,835

HOMOGENEOUS NICKEL-BASE SUPERALLOY CASTINGS

John K. Tien, Rocky Hill, and Robert P. Gamble, Killingworth, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Oct. 16, 1970, Ser. No. 81,229
Int. Cl. C22c 19/00
U.S. Cl. 148—32.5 4 Claims



Homogeneous castings are achieved in the nickel-base superalloy systems by the suppression of dendritic segregation in controlled unidirectional solidification, the castings being characterized by cellular and plane front microstructures.

3,677,836

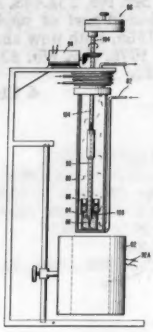
LIQUID EPITAXY METHOD OF FABRICATING CONTROLLED BAND GAP GaAl AS ELECTROLUMINESCENT DEVICES

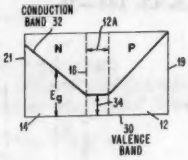
Max R. Lorenz, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 23, 1969, Ser. No. 860,355
Int. Cl. H02l 7/38; H05b 33/00; H01s 3/18
U.S. Cl. 148—171 6 Claims

The electroluminescent diodes are fabricated of gallium aluminum arsenide in which the band gap is controlled during the growth to provide improved efficiency devices. The bodies are grown by liquid phase epitaxy so that there is a centrally located region of constant band gap adjacent the junction in which the recombination radiation takes place. In the regions extending from this recombination radiation region in both directions to the opposite surfaces

of the diode, the band gap is larger. The variation in band gap is achieved by controlling the temperature during the





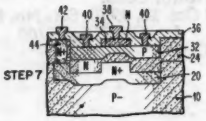
growth as well as by adding aluminum to the melt and a portion of the device is grown isothermally.

3,677,837

METHOD OF MAKING PEDESTAL TRANSISTOR HAVING MINIMAL SIDE INJECTION

Kanu G. Ashar, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1969, Ser. No. 847,857
Int. Cl. H01l *7/36, 11/00;* B01j *17/00*
U.S. Cl. 148—175 **4 Claims**



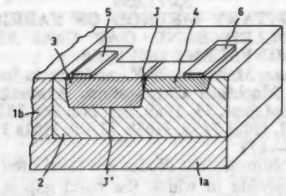
A high performance transistor formed in a monolithic semiconductor body with a projecting pedestal portion, an emitter region in the upper portion of the pedestal with the emitter base junction terminating at the periphery of the pedestal.

3,677,838

METHOD OF MANUFACTURING A ZENER DIODE

Michel de Brebisson, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 18, 1969, Ser. No. 834,403
Claims priority, application France, June 27, 1968, 156,892
Int. Cl. H01l *7/44*
U.S. Cl. 148—187 **5 Claims**



A method of manufacturing an improved Zener diode is described. An epitaxial layer is grown on a substrate and two adjacent surface portions of the epitaxial layer are selected with the surface portions being spaced in the vicinity of the Zener diode p-n junction to be formed. Then, donor and acceptors are diffused into the surface portions in directions parallel to the surface and toward each other until the diffused fronts meet to form the desired p-n junction which extends normal to the surface.

3,677,839

COMPOSITE PROPELLANT CONTAINING BALLISTIC MODIFIERS DERIVED FROM METAL CHELATES

David C. Sayles, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Feb. 23, 1967, Ser. No. 619,118
Int. Cl. C08d *5/06*
U.S. Cl. 149—19 **3 Claims**

A novel ballistic modifier for use in composite propellant compositions. The ballistic modifier contains a metal salt of a bis(salicyl)aldimine. Metals with atomic numbers from twenty-four to thirty may be used.

3,677,840

PYROTECHNICS COMPRISING OXIDE OF SILVER FOR WEATHER MODIFICATION USE

Graham C. Shaw, Garland, and Russell Reed, Jr., Brigham City, Utah, assignors to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed Sept. 18, 1969, Ser. No. 859,165
Int. Cl. C06d *3/00*
U.S. Cl. 149—19 **5 Claims**

A pyrotechnic composition which upon combustion produces mixed silver halide nuclei for use in influencing weather comprises a composition made by curing a mixture comprising silver oxide, an alkali iodate, an alkali perchlorate and a curable oxygenated or fluorinated organic liquid polymer binder. The composition burns smoothly to provide by metathesis a mixture of silver halides as substantially the only solid or condensed phase reaction products, and leaves substantially no residue. The reaction products form nuclei for causing nucleation of water in clouds.

3,677,841

GAS GENERATOR COMPOSITION CONTAINING A NITROGEN-RICH COMPOUND AND A CATALYST

William M. Ayres, Ridgecrest, and Ronald A. Henry, China Lake, Calif., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Apr. 17, 1969, Ser. No. 817,623
Int. Cl. C06b *15/02*
U.S. Cl. 149—92 **10 Claims**

Gas generator formulations which decompose exothermically at low pressures and low flame temperature suitable for disseminating solid agents with high efficiency. A representative formulation comprises the nitrogen-rich fuel, triaminoguanidinium 5-nitroaminotetrazole intimately mixed with the catalyst, vanadyl acetylacetonate.

ERRATUM

For Class 149—109 see:
Patent No. 3,678,140

3,677,842

LOW LIGHT LEVEL TRACER MIX

Thomas A. Doris, Jr., Palmyra, N.J., assignor to the United States of America as represented by the Secretary of the Army

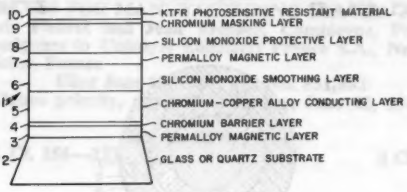
No Drawing. Filed Mar. 10, 1970, Ser. No. 18,320
Int. Cl. C06b *15/00*
U.S. Cl. 149—109 **4 Claims**

A low light level, long-burning, small arms tracer pyrotechnic mixture for use with night vision equipment comprising, by weight percent: strontium peroxide, 10–90; barium perioxide, 0–65; calcium resinate, 5–15; and magnesium carbonate, 10–15.

3,677,843
METHOD FOR FABRICATING MULTILAYER MAGNETIC DEVICES

Stefan E. Reiss, Watertown, Mass., assignor to Sylvania Electric Products Inc.

Filed Feb. 2, 1970, Ser. No. 7,575
Int. Cl. C23f 17/00; H01f 41/14; H05k 3/06
U.S. Cl. 156—3 5 Claims



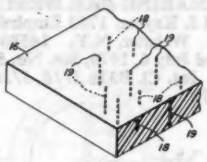
Method for fabricating multilayer magnetostatically-coupled thin-film magnetic memory devices. A plurality of layers are deposited in succession on a glass or quartz substrate. The layers include a first Permalloy magnetic film, a chromium barrier layer, a chromium-copper alloy conducting layer, a silicon monoxide smoothing layer, a second Permalloy magnetic film, a silicon monoxide protective layer, a chromium masking layer, and a photosensitive resistant material masking layer.

Openings delineating the boundaries of the desired magnetic memory devices are then formed in the masking layer of photosensitive resistant material. Selective etching materials are then used, in four successive etching operations, to initially form an opening in the chromium masking layer (first etching operation), followed by openings in the silicon monoxide protective layer, the second Permalloy magnetic film, the silicon monoxide smoothing layer, and the chromium-copper alloy conducting layer (second etching operation), an opening in the chromium barrier layer (third etching operation), and an opening in the first Permalloy magnetic film (fourth etching operation).

3,677,844
PROCESS FOR MAKING AN ELASTIC STRETCHY SHEET CONTAINING APERTURES HAVING A DIAMETER OF AT LEAST FIVE ANGSTROMS AND BEING SUITABLE AS A MOLECULAR SIEVE

Robert L. Fleischer and Paul B. Price, Schenectady, N.Y., assignors to General Electric Company

Continuation of abandoned application Ser. No. 702,366, Feb. 1, 1968. This application Nov. 19, 1970, Ser. No. 91,140
Int. Cl. B29d 7/20
U.S. Cl. 156—2 7 Claims

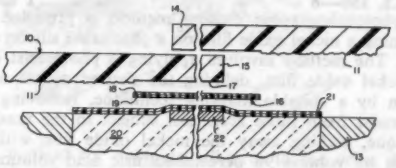


A shaped copolymer comprised of etchable polymer and unetchable polymer contributing desired properties to the copolymer is bombarded with charged particles. As the particles pass through the shaped copolymer, they form substantially straight tracks of damaged copolymer. The bombardment of the copolymer with the individual charged particles is so highly localized that it damages only the track defining portions of the copolymer, leaving the remainder of the copolymer substantially unaffected. The copolymer is then contacted with an agent to etch, i.e. extract, the tracks of damaged copolymer, and any additional desired portion of adjacent undamaged copolymer, leaving a substantial number of recesses or apertures depending upon the particular bombarding procedure and the thickness of the copolymer. The aperture-containing copolymer product of the present invention includes properties usually associated with non-etchable polymer. It is useful as a filter.

3,677,845
METHOD FOR THE IN SITU COVERING OF LARGE DIAMETER PROCESS ROLLS WITH HEAT SHRINKABLE FILMS OF FLUORINATED ETHYLENE POLYMERS AND THE LIKE

Robert Roberts, Wilmington, Del., assignor to Fluorodynamics, Inc., Newark, Del.

Filed July 24, 1970, Ser. No. 57,997
Int. Cl. B29c 27/00; C09j 5/02, 5/06
U.S. Cl. 156—3 10 Claims

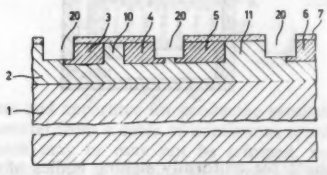


A method of covering large diameter rolls with a heat shrinkable covering material, particularly high molecular weight, high viscosity, thermoplastic materials, such as Teflon FEP film, is disclosed, which includes in situ heat seal joining of an oriented film to form a heat shrinkable tube. The new method provides for a complete circumferential adhesive bond between the roll surface and the relatively non-adherent covering material, specifically including the region of the heat seal joint, by utilizing a narrow sealing strip along the longitudinal joint of the covering material. The sealing strip is heat sealable on one side to the covering material and adhesively joinable to the roll surface of its other side.

3,677,846
MANUFACTURING SEMICONDUCTOR DEVICES

Matthias Johannes Joseph Theunissen and Wilhelmus Henricus Cornelis Gerardus Verkuijlen, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1970, Ser. No. 34,488
Claims priority, application Netherlands, May 7, 1969, 6907023
Int. Cl. H01l 7/50, 7/52
U.S. Cl. 156—8 1 Claim



A method of manufacturing a plurality of semiconductor devices from one plate-shaped semiconductor body in which one side of a plate-shaped semiconductor substrate is covered with a zone of semiconductor material said zone consisting, at least at the boundary with the underlying substrate of a semiconductor material differing from

the adjoining substrate material in its composition and/or conductivity properties, the substrate being then removed by means of a selective electrolytic etching process while maintaining said zone, the zone being furthermore divided into separate, individual wafers of semiconductor material, characterized in that prior to the electrolytic etching process grooves are provided in the zone, the depth of said grooves being smaller than the thickness of the zone, so that after the electrolytic etching process the semiconductor material of the zone remains coherent and the division into the separate wafers is obtained by a chemical etching process from the side of the substrate.

3,677,847

PHOTOLITHOGRAPHIC ETCHING METHOD FOR NICKEL OXIDE

Alfred E. Feuersanger, Franklin Square, and Lawrence M. Harris, Brooklyn, N.Y., assignors to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Mar. 15, 1971, Ser. No. 124,607
Int. Cl. H05k 1/00; H01l 7/50
U.S. Cl. 156—8 **1 Claim**

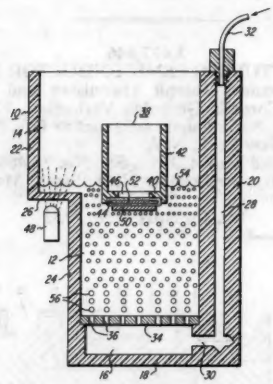
A photolithographic etching method is provided for patterning a nickel oxide film on a passivated silicon substrate. The method involves applying a photoresist over the nickel oxide film, defining the desired nickel oxide pattern by a suitable masking technique, removing the photoresist from those areas not subject to the masking technique, etching away the nickel oxide film with 80 percent by volume 96 percent sulfuric acid solution at about 80 degrees C., and stripping away the remaining photoresist to expose the desired nickel oxide pattern.

3,677,848

METHOD AND MATERIAL FOR ETCHING SEMICONDUCTOR BODIES

Arthur Irwin Stoller, North Brunswick, and Stephen Thomas Opresko, Hightstown, N.J., assignor to RCA Corporation

Filed July 15, 1970, Ser. No. 55,067
Int. Cl. H01l 7/00
U.S. Cl. 156—17 **6 Claims**



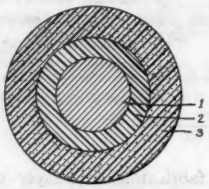
An etchant for uniformly etching bodies of silicon or germanium which provides an etched surface which is free from pits and peaks. The body is etched by immersing a surface of the body in a mixture of hydrofluoric acid, nitric acid, acetic acid and either sodium chlorite or sodium nitrite and bubbling a gas into the etchant so that at least some of the gas bubbles impinge on the surface of the body.

3,677,849

MEDIUM VOLTAGE CABLES

Luigi Lombardi, Milan, Italy, assignor to Pirelli Società per Azioni, Milan, Italy

Original application May 20, 1968, Ser. No. 730,657, now Patent No. 3,541,228, dated Nov. 17, 1970. Divided and this application Oct. 6, 1969, Ser. No. 870,906
Claims priority, application Italy, May 23, 1967, 16,392/67
Int. Cl. H01b 13/08, 13/19
U.S. Cl. 156—53 **5 Claims**



Describes a medium voltage cable including an insulating layer and a semiconductive layer in contiguous but not adhesive relationship. The insulating layer is an amorphous olefine copolymer, saturated or unsaturated, and the semiconductive layer is a composition containing carbon particles dispersed in chlorosulfonated polyethylene.

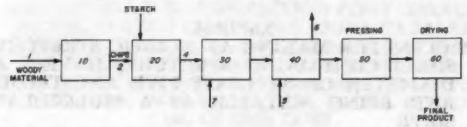
Product is prepared by heat treatment of the superimposed layers on a conductor.

3,677,850

METHOD OF PRODUCING FIBROUS PRODUCTS

Thomas E. Holt, Hudson, Quebec, and Edward B. Taylor, Montreal, Quebec, Canada, assignors to Esso Research and Engineering Company, Linden, N.J.

Filed June 25, 1969, Ser. No. 836,258
Int. Cl. B29j 5/02
U.S. Cl. 156—62.2 **5 Claims**



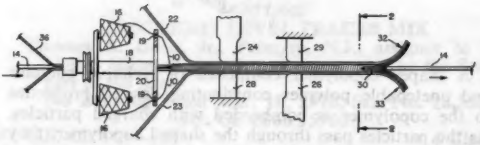
In the method of manufacturing woodfiber board products, starch binder is cooked and dispersed over the woodfiber surfaces coincidental with the preparation of the woodfibers.

3,677,851

METHOD OF MAKING PILE WEATHERSTRIPPING

Emil J. Kayser, 1763 Empire Blvd., Webster, N.Y. 14580

Filed July 6, 1970, Ser. No. 52,359
Int. Cl. B32b 3/18, 3/20
U.S. Cl. 156—73 **6 Claims**



Pile type weatherstripping is made by winding yarn on a traveling mandrel, bonding strips of backing material to

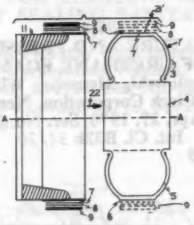
the yarn along opposite sides of the mandrel, and then parting the yarn at points between the backing strips. Two weatherstrips are produced simultaneously. An insert such as a longitudinal fin may be fed between the yarn and the mandrel to produce a combination strip including both pile and an auxiliary sealing member.

3,677,852

PROCESS FOR MANUFACTURING BELTED TIRES

Louis Fleuret and Jean Trepaez, Compiegne, France, assignors to Uniroyal Engelbert France S.A., Neuilly sur Seine, France

Filed June 10, 1969, Ser. No. 831,863
Claims priority, application France, June 12, 1968, 154,777
Int. Cl. B29h *17/26*
U.S. Cl. 156—127 5 Claims



In the manufacture of radial ply tires having an annular multi-ply belt between the carcass crown and tread, a cylindrical casing is first prepared and a first belt ply is placed annularly about the casing while it is still in cylindrical form, i.e., prior to toroidal shaping. An incomplete belt assembly with one less ply is prepared, and annularly surrounded by a tread member. Subsequently the tread and incomplete belt assembly are placed annularly about the casing and first belt ply, after which the assembled casing and first belt ply is expanded to force the first belt ply radially outward into contact with the remainder of the belt and tread assembly to complete the shaped raw tire. Finally, the completed assembly is cured by conventional methods to mold the components into a unitary belted tire structure.

3,677,853

WAFER MOUNTING

Thomas A. Anzelone, Jr., Fort Lauderdale, Harold A. Larson, University Park, and Alfred A. Stricker, Pompano Beach, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,112
Int. Cl. B32b *31/00*
U.S. Cl. 156—160 5 Claims

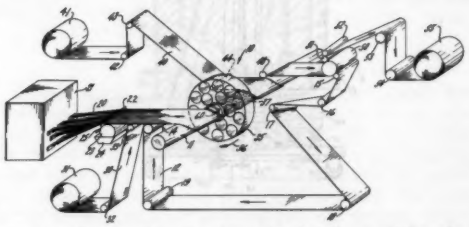
Wafers are bonded to a carrier surface which tends to bulge in reaction to the bonding process, particularly heating, but to return to a flat configuration after bond curing. Void-free bonding is obtained by shaping the bonding material to the carrier bulge and introducing the wafer to the high point of the bulge relative to the flat surface of the carrier. Closure pressure between wafer and carrier and the reaction of the carrier in cooling to a substantially flat surface configuration coperate to complete the bonding.

3,677,854

METHOD FOR APPLYING ADHESIVE TO CROSS THREADS WHILE CROSSLAYING

Karl E. Sager, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed May 21, 1969, Ser. No. 826,390
Int. Cl. B65h *81/02*
U.S. Cl. 156—173 7 Claims



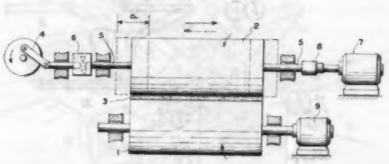
A method for applying adhesive to the cross threads in a thread crosslaying apparatus is disclosed. The cross threads served by a carrier rotating around an elongated medium moving helically around a mandrel are drawn over the face of an adhesive applicator located between the mandrel and the carrier. The spacing and continuity of adhesive applied to the cross threads is governed by the number, size and shape of the openings in the adhesive applicator and the relative speed and direction of rotation of the applicator relative to the carrier.

3,677,855

PROCESS AND APPARATUS FOR THE PRODUCTION OF SYNTHETIC TEXTILE STUFFING MATERIAL

Robert Bolliand and Claude Saligny, Lyon, France, assignors to Societe Rhodiaceta, D.A.P.I.D., Paris, France

Filed June 24, 1970, Ser. No. 49,487
Claims priority, application France, June 27, 1969, 6921813
Int. Cl. D04h *3/12*
U.S. Cl. 156—181 1 Claim



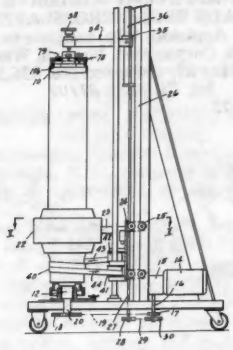
A process and apparatus for producing synthetic textile stuffing material from a cable of continuous synthetic filaments, which may or may not be crimped, for use in stuffing articles such as sleeping bags, anoraks, quilts, etc. This process consists in passing a cable of continuous synthetic filaments between two smooth rollers turning at different peripheral speeds and having an alternate relative transverse movement, receiving the thus flattened cable of continuous synthetic filaments on a conveyor belt, spraying this flattened cable with a binding material, and causing the binding material to harden.

3,677,856

METHOD FOR COVERING A PRINTING ROLLER

James A. MacCallum, Danville, Ill., Velmar E. Howard, Veedersburg, Ind., and Daniel A. Coberley, Danville, Ill., assignors to Hurletron Incorporated, Danville, Ill.

Filed Aug. 25, 1969, Ser. No. 852,784
Int. Cl. B65h *81/00*
U.S. Cl. 156—187 4 Claims



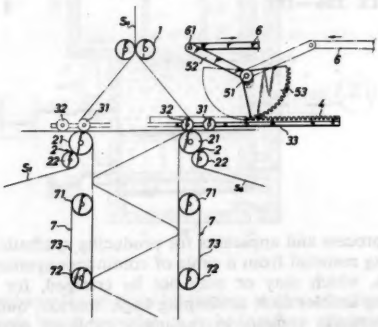
A printing roller having an extruded covering sleeve, in one form having electrical characteristics for optimum electrically assisted printing; and in another form having optimum solvent resistance. A method and apparatus for applying such sleeves including a belt wrapped at least 360° about the sleeve and driven by rotation of the roller and moved progressively along the sleeve to apply the sleeve to the roller and to remove gaseous entrapment, and preferably also to disperse a reservoir of adhesive over the interface between the roller and sleeve.

3,677,857

METHOD FOR MANUFACTURE OF CORRUGATED BOARDS

Rinnosuke Susuki, Tokyo, Hiroshi Hoshi, Chiba-ken, and Jiro Saito and Masao Suzuki, Tokyo, Japan, assignors to Raion Yushi Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1970, Ser. No. 11,767
Claims priority, application Japan, Feb. 19, 1969, 44/12,750
Int. Cl. B31f *1/22*
U.S. Cl. 156—210 10 Claims



A method and apparatus suited for manufacture of corrugated boards whose pitches, heights and profiles of corrugations may be varied in a simple manner during the course of manufacture. Opposed to the conventional method and apparatus wherein a flat sheet or sheets are adhered to one or both sides of a corrugated sheet which is formed by corrugating rolls or the like, a sheet is reciprocated between a pair of spaced apart flat sheets while they are advanced, thereby adhering the corrugated sheet alternately to the flat sheets. By varying the amplitude or stroke of the reciprocal movement of the sheet, the heights of corrugations may be varied while the pitches of corrugations can be varied by varying the feed of both flat sheets during the time when the sheet to be corrugated moves from one flat sheet to the other, that is the line of adhesion of one flat sheet to the other. Profiles of corrugations may be varied by varying the widths (in the direction of advancement of the sheet to be corrugated) of adhesion between the corrugated sheet and the flat sheets, thereby varying the cross sections of corrugations into rectangular, trapezoid, etc. The invention may use not only paper board but also synthetic resin sheets.

3,677,858

HIGH TEMPERATURE AND PRESSURE BONDING OF URETHANE FOAM

Robert C. Sokolowski, Menasha, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 27, 1970, Ser. No. 32,080
Int. Cl. B32b *31/20*
U.S. Cl. 156—219 4 Claims

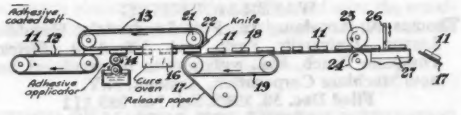
The surface characteristics of a polyurethane foam are modified by laminating the foam to a cellulosic web. Lamination is accomplished by placing the cellulosic web in contact with the foam and thereafter bonding the web-foam structure at intermittent points by the application of heat and pressure in particular amounts.

3,677,859

METHOD FOR APPLICATION OF PRESSURE-SENSITIVE ADHESIVES

Harold A. Clark, 4107 Cruz St., Midland, Mich. 48640

Filed Aug. 13, 1970, Ser. No. 63,536
Int. Cl. B32b *31/00*
U.S. Cl. 156—250 4 Claims



A pressure-sensitive adhesive backing is applied to articles by adhering the face of the articles to a belt coated with a pressure-sensitive adhesive. The belt passes through a curing oven and a backing sheet coated with a release coating is applied over the cured adhesive before release from the belt.

3,677,860

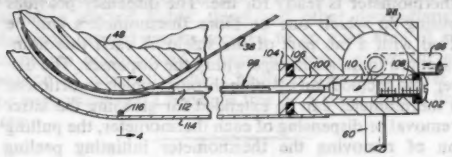
METHOD AND APPARATUS FOR TRANSFERRING A MAGNETIC SOUND TRACK TO MOVIE FILM

Edward Zychal, Cornwell Heights, Pa., assignor to Zyco Manufacturing, Inc., Cornwell Heights, Pa.

Filed Feb. 19, 1969, Ser. No. 800,653
Int. Cl. B32b *31/08, 31/12*
U.S. Cl. 156—299 15 Claims

A magnetic sound track is transferred onto movie film by a machine which simultaneously feeds film and magnetic tape to a laminating zone where the film passes over

a laminating wheel, an open channel curved capillary tube applies a bonding agent to an elongated area, and the magnetic sound track is laminated to the film. The machine



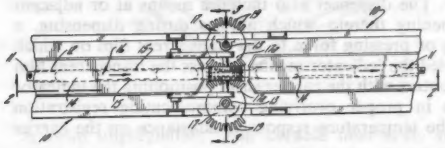
is provided with fail-safe mechanisms to shut down the process in case of a break in the film or tape, or the absence of the bonding agent.

3,677,861

APPARATUS FOR PLEATING AND ULTRASONICALLY SEALING SANITARY NAPKIN TAB ENDS

Nicholas T. Knauf, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 8, 1969, Ser. No. 882,813
Int. Cl. B32b *31/10, 31/20*
U.S. Cl. 156—380 **4 Claims**



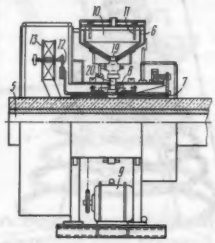
An apparatus for simultaneously tuck-inpleating and heat sealing the tab ends of sanitary napkins using rotatably driven tucking fingers, an ultrasonic sealing horn and associated anvil which mesh with the tucking fingers.

3,677,862

DEVICE FOR APPLYING ONTO PIPES COATINGS OF VISCOUS INSULATING SUBSTANCES

Vladimir Alexeevich Gusev, ulitsa Malaya Podvalnaya 14, kv. 9, and Nikolai Nikolaevich Rudenko, ulitsa Kikvidze 13–a, kv. 10, both of Kiev, U.S.S.R.

Filed Dec. 27, 1968, Ser. No. 787,407
Int. Cl. B65h *81/00*
U.S. Cl. 156—392 **4 Claims**



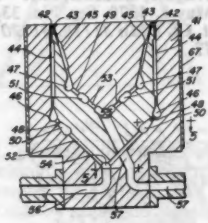
A device for applying successive layers of a viscous substance and tape to a pipe includes a hollow cylinder surrounding the pipe. The pipe is displaceable axially while the cylinder is rotatably driven. The cylinder includes circumferentially spaced openings through which the viscous substance is passed to the pipe surface. A tape spool is connected to the end of the cylinder and rotates together with the cylinder to apply tape about the pipe.

3,677,863

DIES FOR PRODUCING MULTI-LAYER TUBES OR FILMS

Heinz Schippers, Walter Geil, and Gerd Albrecht, Remscheid-Lennep, and Reinhold Jung, Wermelskirchen, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Original application Feb. 28, 1969, Ser. No. 803,207. Divided and this application Nov. 4, 1971, Ser. No. 195,587
Claims priority, application Germany, Aug. 8, 1968, P 17 79 410.4; Nov. 14, 1968, P 18 08 883.0
Int. Cl. B29d *23/04*
U.S. Cl. 156—500 **10 Claims**



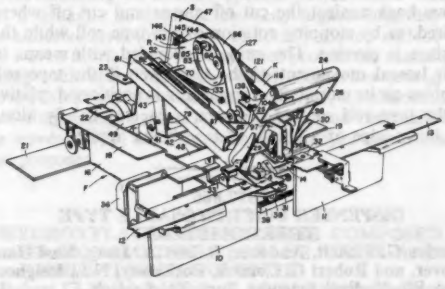
Improved extrusion dies for production of multi-layer tubes or films wherein the feed lines or passages for the plastic composition to be extruded terminate at points situated one behind the other in the axial center portion of the die. The plastic composition is fed through a plurality of radially connecting lines from said points to annular passages and ultimately to annular nozzle means in the die. The annular passages are located in the die body in axially spaced transverse planes through the die body.

3,677,864

TAPE DISPENSER AND APPLICATOR

John E. Morse and Norman J. Rosenburgh, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

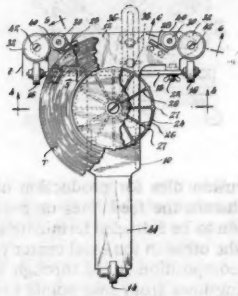
Continuation of application Ser. No. 662,686, Aug. 23, 1967. This application Sept. 4, 1970, Ser. No. 69,940
Int. Cl. B31f *5/06;* **G03d** *15/04*
U.S. Cl. 156—505 **7 Claims**



A device having a tape applicator mounted on a reciprocal knife carriage is adapted to press an adhesive-coated tape across abutting end of two strips to form a splice. Another reciprocal carriage carries a roll of the tape fed through a tape-folding device and a cutter on the knife carriage. At the beginning of a cycle, the tape-roll carriage moves forward to feed a piece of tape, previously stripped from the roll, so that the leading edge is

positioned over the abutting ends of the strips. The knife carriage also moves forward to a position over the leading edge of the tape and presses the tape against the strips to form a splice. While the applicator is holding the end of the tape, the tape-roll carriage moves away from the splice pulling a length of tape from the roll for the next splice and through the tape-rolling device to make it more rigid for feeding. The tape is then cut; the trailing edge is affixed to the splice; and the applicator and cutter are recocked for the next cycle.

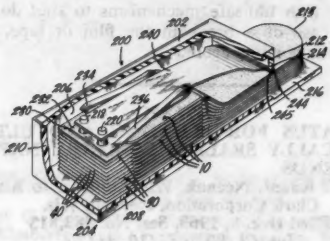
3,677,865
SIDE DELIVERY TAPE APPLICATOR
Walter Wagner, Dumont, N.J. 07628
Filed May 1, 1970, Ser. No. 33,546
Int. Cl. B32b *31/18, 31/20*
U.S. Cl. 156—577 **5 Claims**



A roll of tape is mounted on a carriage and tape is drawn off and applied laterally of the carriage to one surface by moving the carriage over an adjoining angularly related surface, and, where possible, with the carriage wheels riding on the said adjoining surface. The roll of tape is mounted on the carriage in a plane parallel with the surface over which the carriage is moved, and means are provided for adjusting the position of the roll of tape toward and away from the wall over which the carriage is moved to compensate for differences in the width of rolls of tape and to bring a side surface of the tape roll close to the wall so that the tape will be applied with an edge close to that wall. Cut off means is disposed relative to guide and applicator means so that the tape may be drawn back against the cut off means and cut off where desired, as by stopping rotation of the tape roll while the carriage is moving. The guide is provided with means to limit lateral movement of the tape even if the tape roll wobbles on its mount. The applicator is positioned relative to the tape roll so that pressure is exerted chiefly along the inner edge of a length of tape being applied.

3,677,866
DISPENSER FOR DISPOSABLE TYPE THERMOMETERS
Charles G. Pickett, Andover, Robert A. Lang, East Hanover, and Robert C. Comers, Rockaway, N.J., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.
Filed Mar. 4, 1971, Ser. No. 120,996
Int. Cl. B65d *83/08*; B65h *3/58*
U.S. Cl. 156—584 **11 Claims**

A dispenser is provided for use with thermometers of the type having a thermally sensitive substance on a thermally conductive sheet and an overlying transparent film carrying indicator means which are superpositionably registrable with the thermally responsive substance to denote temperature change upon change of state in the substance, which thermometer normally is provided with a removable shield interposed between the substance and the indicator means to prevent communication between the two until the thermometer is ready for use. The dispenser provides a housing in which one or more thermometers can be received with a tab part of the shield of each thermometer secured to an anchorage within the dispenser. The dispenser also includes an opening through which a portion of each thermometer can be extended for grasping the latter for removal or dispensing of each thermometer, the pulling action of removing the thermometer initiating peeling



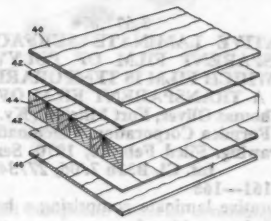
away of the shield from the thermometer within the dispenser. The dispenser also includes means at or adjacent the opening thereto which applies during dispensing, a wiping or pressing force to the transparent film on which is carried the indicator means to press the transparent film into contact with the carrier sheet positioning the indicator means in proper overlying communicating registration with the temperature responsive substance on the carrier sheet.

3,677,867
COLLAPSIBLE ARTIFICIAL CHRISTMAS TREE
Linda K. Westlund, 6879 E. Cholla St., Scottsdale, Ariz. 85254
Filed Mar. 24, 1971, Ser. No. 127,586
Int. Cl. A47g *33/08, 33/16*
U.S. Cl. 161—14 **5 Claims**

A collapsible Christmas tree comprising a resilient spring-like conically-shaped spiral frame member, having an electrical conductor means and ornamentation means connected thereto, said frame member having a plurality of convolutions adapted to be concentrically collapsed into a generally flat spiral configuration; suspension means interconnecting said convolutions to support them in vertically spaced relation to each other when

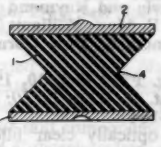
said frame is in a conically-shaped spiral configuration, said electrical conductor means and said ornamentation means permanently connected to said frame member and including electric lights, tinsel and other decorations; a clamping support means secured to an apex area of said frame for holding said suspension means either for suspension of said collapsible Christmas tree from above or for supporting said Christmas tree on a stand from a floor area.

3,677,868
LAMINATED BOARD STRUCTURE AND METHOD OF MAKING SAME
Charles L. Boggs, Statesville, N.C., assignor to International Paper Company, New York, N.Y.
Filed Nov. 24, 1969, Ser. No. 884,454
Int. Cl. B32b *21/10*
U.S. Cl. 161—37 **8 Claims**



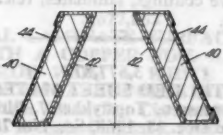
A resin impregnated, resin curable fiber mat, and a method for using the mat as a dimensional stabilizing element in a laminate structure, which is partially cured prior to use in the laminate structure and is fully polymerized by the addition of suitable resin when the mat is to be used.

3,677,869
POLYUREAURETHANE SHOCK ABSORBING COMPOSITIONS
Daniel A. Chung, Stow, and Charles J. Pearson, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 27, 1970, Ser. No. 93,326
Int. Cl. B32b *3/30*; C08g *41/04*; F16f *7/12*
U.S. Cl. 161—42 **19 Claims**



A resilient shock absorbing polyureaurethane composition and shock absorbing units prepared therefrom, such as railroad draft gears. The shock absorbing composition may be characterized by deflecting from about 0.3 to about 0.6 inch at 25° C. upon the application of 1800 pounds per square inch to the end surfaces of the composition when it is generally disc-shaped of required dimensions with a V-shaped groove sidewall connecting its end surfaces. The polyureaurethane composition is prepared by reacting specific diamines with the reaction product of specific aromatic diisocyanates with a mixture of specific polyether polyols and polyester polyols of required amounts and required molecular weight ranges.

3,677,870
HEAT SHIELDS
Kenneth John McGuire, Bedfordshire, England, assignor to Delaney Gallay Limited, Biggleswade, Bedfordshire, England
Filed Aug. 22, 1969, Ser. No. 852,401
Claims priority, application Great Britain, Mar. 28, 1968, 14,996/68; Sept. 13, 1968, 43,759/68
Int. Cl. B32b *3/04*
U.S. Cl. 161—43 **5 Claims**



A heat shield, primarily intended for aerospace applications, comprising a mass of thermo-insulating material which is covered on one side by a thin metal skin and on the other side by a moulded sheath which extends round the edges of the shield and is bonded to the metal skin totally to enclose the insulating material. The heat shield can be fabricated or formed in any desired shape.

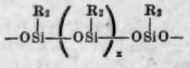
3,677,871
MULTI-LAYERED ARTIFICIAL LEATHER MATERIAL
Saburo Oohara, Kyoto, Koitsuro Amemiya, Osaka, Yasushi Nishijima, Hirakata, and Mitsuyoshi Fukushima and Kunio Shimizu, Osaka, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 11, 1970, Ser. No. 62,947
Claims priority, application Japan, Aug. 14, 1969, 44/64,283; Mar. 12, 1970, 45/21,069
Int. Cl. B32b *5/18*
U.S. Cl. 161—84 **4 Claims**

Natural leather-like sheet materials of homogeneous microporous structure having high bending strength and excellent moisture-permeability and abrasion resistance, which are composed of four layers: a substrate layer of non-woven fabric finished with a synthetic butadienic rubber; a woven fabric layer; a microporous adhesive layer consisting of a specific polyurethane and conjoining the above mentioned two layers and; a microporous grain layer consisting of another specific polyurethane which has a dynamic modulus of elasticity higher than that of the adhesive layer and covers uniformly the top surface of the woven fabric layer. An improved process for manufacturing such sheet materials, which comprises setting a woven fabric superimposed on a substrate, simultaneously with coagulating a grain layer polyurethane resin laid on the woven fabric, and an apparatus employed therefor are also proposed.

3,677,872
HYDROXYLATED COPOLYMERS COMPOSED OF MONOMETHYLSILOXANE UNITS AND DIPHENYLSILOXANE UNITS
Robert C. Antonen, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
No Drawing. Original application Feb. 25, 1969, Ser. No. 802,217, now Patent No. 3,632,794. Divided and this application Oct. 27, 1970, Ser. No. 84,488
Int. Cl. B32b *17/04*
U.S. Cl. 161—93 **1 Claim**

Hydroxylated copolymers of $(C_6H_5)_2SiO$ units and $CH_3SiO_{1.5}$ units are disclosed. The diphenylsiloxane units are present in an amount of 20 to 50 mol percent and are bonded to monomethylsiloxane units which contain the

hydroxyl groups. Also disclosed are the above hydroxylated copolymers modified by linking segments of



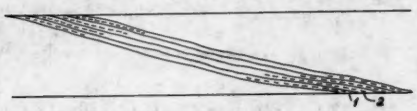
where x is at least 2 and R is methyl, phenyl or 3,3,3-trifluoropropyl and the segments are present in amounts of 1 to 50 weight percent. The hydroxylated copolymers and the modified hydroxylated copolymers are resins useful in protective coatings, laminates, release coatings and molding resins.

3,677,873

EXTRUDED SHEET MATERIAL

Ole-Bendt Rasmussen, Topstykket 7, Birkerod, Denmark

Filed Dec. 27, 1968, Ser. No. 787,387
Claims priority, application Great Britain, Dec. 29, 1967, 59,141/67
The portion of the term of the patent subsequent to May 12, 1987, has been disclaimed
Int. Cl. B32b *3/10, 5/02, 31/30*
U.S. Cl. 161—109 **10 Claims**



An extruded sheet material having disrupted surface layers and a continuous core comprising thin lamellae laying one upon the other in flat overlapping sandwich-like arrangement, said lamellae being bonded together in the core zone and being disconnected or connected through disrupted connections in the surface layers.

A method of extruding two extrudable materials to form a sheet structure consisting of alternating lamellae of said materials, one of said materials being extruded only in the surface layers, transversely smearing out said sheet structure and subsequently disrupting the continuous structure of the surface layers.

3,677,874

INSULATION PRODUCT AND METHOD

Robert W. Sterrett, Wayland, Mass., and Francis J. Jacob, New Castle, Pa., assignors to W. R. Grace & Co., New York, N.Y.

Original application Jan. 20, 1967, Ser. No. 610,524. Divided and this application Mar. 24, 1970, Ser. No. 22,197
Int. Cl. B32b *3/00, 3/26, 5/14*
U.S. Cl. 161—116 **4 Claims**

An insulation board is made by laminating to the surface of a body of foamed plastic resin, such as foamed polystyrene, a film of higher density foamed plastic resin such as foamed polystyrene.

3,677,875

METHOD AND MEANS OF DIE MATRIX EXPANSION

Victor E. Althouse, Los Altos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 19, 1970, Ser. No. 65,188
Int. Cl. B32b *3/00*
U.S. Cl. 161—117 **15 Claims**

A method and means of handling and separating small, fragile objects such as "dice" bearing miniaturized electronic circuitry, one from the other. Such dice or other objects rest upon and preferably are transiently adhered to the surface of a foam expansible plastic article which is subsequently expanded to enlarge the interstices between individual dice so that the dice can be conveniently picked up by, e.g., vacuum or tweezer techniques. A wafer having fault lines therein defining dice can be applied to the surface and cracked along the fault lines to form interstices between the dice. Alternatively, the wafer can be first cracked along the fault lines to form an assembly of dice having interstices therebetween, which assembly can then be transferred to the foam expansible surface for expansive enlargement of the interstices or conversely the wafer may be placed on the surface before the fault lines are formed. Preferably the foam expansible plastic is a cross-linked polymer, most preferably one which is tacky during the expansion process so as transiently to adhere the dice to the expansible plastic article. Alternatively, that transient adhesion can be secured where desired by the use of a light adhesive.

3,677,876

DECORATIVE LAMINATE SURFACED WITH A TRANSPARENT FILM OF POLYVINYL FLUORIDE WHICH FILM IS TEMPORARILY COVERED WITH A TRANSPARENT FILM OF NYLON

Jay Thomas Oliver, Fort Mitchell, Ky., assignor to Formica Corporation, Cincinnati, Ohio

No Drawing. Filed Feb. 18, 1970, Ser. No. 12,425
Int. Cl. B32b *7/06, 27/34*
U.S. Cl. 161—165 **6 Claims**

A decorative laminate comprising a heat and pressure consolidated assembly of

(1) a plurality of kraft paper core sheets,
(2) an alpha-cellulose paper decorative sheet,
(3) a film of a homogeneous blend of polyvinyl fluoride containing uniformly dispersed therein from about 0.1% to about 10% by weight of a ploymer of a polymerizable 2-hydroxy-benzophenone, and
(4) a removable film of nylon,

wherein said kraft paper sheets had been pre-impregnated with a thermosetting phenolic resin and said alpha-cellulose sheet had been pre-impregnated with a thermosetting melamine-formaldehyde resin, all of said thermosetting resins having been converted to the thermoset state during the heat and pressure consolidation step.

3,677,877

ARTICLE OF SILICONE RUBBER HAVING SURFACES RESISTANT TO DIRT PICK-UP

Virgil L. Metevia and Raymond M. Narlock, Bay City, and Milfred E. Mast, Williams Township, Bay County, Mich., assignors to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Oct. 30, 1970, Ser. No. 85,703
Int. Cl. B32b *25/20;* **D06n** *7/04*
U.S. Cl. 161—164 **2 Claims**

Articles of optically clear filled silicone rubber and filled silicone rubber articles having aesthetic value have surfaces resistant to dirt pick-up when treated with cold plasma.

3,677,878

INTEGRATED INSULATED AND WEATHERPROOF ROOF SYSTEM

John David Carlson, Bradford Woods, Pa., assignor to Koppers Company, Inc.

Filed Feb. 2, 1971, Ser. No. 111,950
Int. Cl. B32b *3/26, 11/04, 13/02*
U.S. Cl. 161—160 **12 Claims**

An integrated, insulated and weatherproof roof system has a base, a first monolithic mass, supported by the base composed of a low-density concrete composition and a second monolithic mass on a surface of the first mass

composed of a bituminous material that is mechanically bonded to the surface of the first mass.

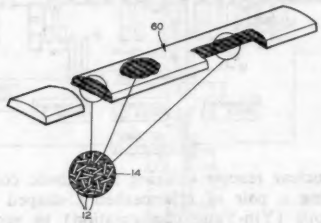
The roof system is formed from initially flowable materials by forming on a base a slurry cement, expanded beads of a thermoplastic material and water, curing the slurry to a solid monolithic mass and forming a layer of a hot bituminous material on a surface of the solid mass.

3,677,879

THERMALLY CONDUCTIVE BEARING MATERIAL

Giuliano D'Andrea, Elnora, N.Y., assignor to the United States of America as represented by the Secretary of the Army

Filed Apr. 28, 1970, Ser. No. 32,666
Int. Cl. B32b *15/20, 19/02*
U.S. Cl. 161—170 **3 Claims**



A light weight composite material consisting essentially of geometrically identical metal fibers uniformly distributed in a randomly oriented fashion throughout a matrix of an epoxy resin mixed with an amine curing agent has been found to be particularly useful as a material for bearings with large surface areas in frictional contact with steel surfaces. The material can be tailored to provide a predetermined thermal conductivity with isotropic or anisotropic characteristics by the proper control of such factors as the thermal conductivity of the matrix, the ratio of fiber volume to that of the matrix, and the geometry of the individual fibers.

3,677,880

SYNTHETIC CONJUGATE FILAMENT FIBERS AND A PROCESS FOR THE MANUFACTURE OF THE SAME

Noboru Fukuma, Nobeoka-shi, Hidehiko Kobayashi, Tokyo, and Kenichi Matsui, Masahira Sakashita, and Hiroshi Henmi, Nobeoka-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 16, 1968, Ser. No. 721,690
Int. Cl. D02g *3/02*
U.S. Cl. 161—173 **14 Claims**

A synthetic conjugated composite filament fiber, consisting of two conjugated polyester filamentary components, one of said components being polyethylene terephthalate and the other of said components being polyethylene diphenoxyethane-4,4'-dicarboxylate, said polyethylene terephthalate being the load-bearing component.

3,677,881

OPEN CELLED POLYPROPYLENE FILAMENT OF IMPROVED UNIFORMITY

Peter R. Riordon, Hudson, Quebec, Canada, assignor to Chemcell Limited, Drummondville, Quebec, Canada

No Drawing. Original application May 15, 1967, Ser. No. 638.419, now Patent No. 3,549,743, dated Dec. 22, 1970. Divided and this application Aug. 19, 1970, Ser. No. 65,355
Int. Cl. D01d *5/00*
U.S. Cl. 161—178 **2 Claims**

The invention relates to filamentary materials having a low apparent density and improved longitudinal uniformity (evenness). The filaments are produced by drawing an elastic fiber of polymeric material having a crystallinity of at least 20% and an elastic recovery from a 25% extension of at least 60% at some temperature below the melting point of the polymer making up said filament. The improvement comprises subjecting the filament to a multi-stage drawing consisting of from 3 to 6 stages wherein the total draw ratio of said multi-stage drawing is from 1.5:1 to 8:1.

3,677,882

INDUSTRIAL LAMINATE SURFACED ON ONE SIDE WITH A COPPER FOIL AND ON THE OTHER SIDE WITH A WHITE PIGMENTED FILM OF ADHERABLE POLYVINYL FLUORIDE

Frederick William Jahns, Jr., Cincinnati, Ohio, assignor to General Electric Company, New York, N.Y.

No Drawing. Filed Feb. 19, 1970, Ser. No. 12,832
Int. Cl. B32b *15/08, 27/30;* **H05k** *1/00*
U.S. Cl. 161—189 **7 Claims**

An industrial laminate surfaced on one side with a copper foil and on the other side with a white pigmented film of adherable polyvinyl fluoride between which layers there are a plurality of paper layers and glass scrim cloth layers each of which have been impregnated with a punching stock thermosetting phenolic resin.

3,677,883

POLYVINYL ACETATE ADHESIVES CONTAINING INORGANIC ZIRCONIUM SALTS

Stanley R. Sandler, Springfield, Pa., assignor to The Borden Company, New York, N.Y.

No Drawing. Filed Nov. 20, 1967, Ser. No. 684,539
The portion of the term of the patent subsequent to Dec. 15, 1987, has been disclaimed
Int. Cl. B32b *23/04, 27/30*
U.S. Cl. 161—251 **9 Claims**

This invention relates to adhesive compositions which form water resistant bonds when cured and more particularly to ambient temperature curing aqueous adhesive compositions which form indistinguishable glue lines comprising a vinyl acetate polymer and a curing agent selected from the group consisting of water-soluble zirconium and zirconyl salts.

3,677,884

VENEER CROSSBINDER AND LAMINATES PREPARED THEREFROM

Leopold F. Bornstein, Wilmington, Mass., assignor to Georgia-Pacific Corporation, Paoli, Pa.

No Drawing. Continuation of application Ser. No. 872,457, Nov. 24, 1969, which is a continuation of application Ser. No. 596,465, Nov. 23, 1966, which in turn is a continuation-in-part of application Ser. No. 327,124, Nov. 29, 1963. This application Feb. 3, 1971, Ser. No. 112,416
Int. Cl. C08g *37/38*
U.S. Cl. 161—262 **14 Claims**

A liquid resin composition comprising an alcohol solution of certain phenol-formaldehyde resins and a lignosulfonate acid salt has been found to be particularly suitable for use in the application of veneers to a base material such as particle board. Ammonium salts, such as ammonium chloride, are advantageously included in the composition. The liquid composition can be utilized for impregnating dry fibrous sheet materials such as cellulosic paper and dried. The resulting, dried, impregnated paper is used as an intermediate layer between, for example, a veneer and particle board, and minimizes telegraphing of surface imperfections from the particle board through the veneer or surfacing layer.

3,677,885

PROCESS FOR THE PREPARATION OF SULFATE PULP DIGESTION WHITE LIQUOR

Katsuo Watanabe, 219 Hama, Okayama-shi, Japan

Filed Nov. 26, 1969, Ser. No. 880,113
The portion of the term of the patent subsequent to May 26, 1987, has been disclaimed
Int. Cl. D21c *11/00*
U.S. Cl. 162—45 4 Claims

A process for regenerating a spent digestion liquor from a sulfate pulp making process by adding a supplemental liquor, and particularly to a process for easily controlling the liquid composition at any desired level by using a supplementary liquor containing as the main ingredient NaSH in place of Na_2SO_4.

3,677,886

METHOD OF PRODUCING HIGHLY ABSORBENT CELLULOSE

Lars-Henrik Forssblad, Iggesund, and Per Jerkeman, Gavle, Sweden, assignors to Korsnas-Marma Aktiebolag, Gavle, Sweden

No Drawing. Filed Dec. 9, 1969, Ser. No. 883,609
Claims priority, application Sweden, Dec. 27, 1968, 17,816/68
Int. Cl. D21h *3/02*
U.S. Cl. 162—72 4 Claims

Highly absorbent cellulose is produced by adding to the pulp an organic anionic or nonionic agent and a cationic retention agent while regulating the amount of the cationic substance in such a way that the Z-potential of the pulp approaches zero.

3,677,887

ANTICOUNTERFEIT TICKET

Kenneth P. Rowsam, Monroe, and De Witt M. Yost, Middletown, Ohio, assignors to The Sorg Paper Company, Middletown, Ohio

Continuation-in-part of abandoned application Ser. No. 776,626, Nov. 18, 1968. This application Mar. 31, 1971, Ser. No. 129,910
Int. Cl. D21h *5/10*
U.S. Cl. 162—140 6 Claims

An anticounterfeit ticket formed from a paper sheet which permits the ink used to print the indicia on the ticket at the time it is issued to penetrate completely through the sheet so that the indicia will be readily visible from either side. The sheet is formed from a furnish of 40–75% of a high alpha (92% or more alpha cellulose) pulp and the remainder a chemical wood pulp. The finished sheet has a basis weight of 45–102 lbs. per ream and a caliper of .007 to .012 inch. The sheet contains a size of 5% wax, 73% starch and 22% thermosetting formaldehyde condensation resin which provides an open sheet in which the fibers are interlocked.

3,677,888

MANUFACTURE OF PAPER USING AMPHOTERIC STRENGTHENING AGENTS

Peter Economou, Bedford, Mass., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 546,214, Apr. 29, 1966. This application July 22, 1969, Ser. No. 843,782
Int. Cl. D21h *3/36*
U.S. Cl. 162—164 10 Claims

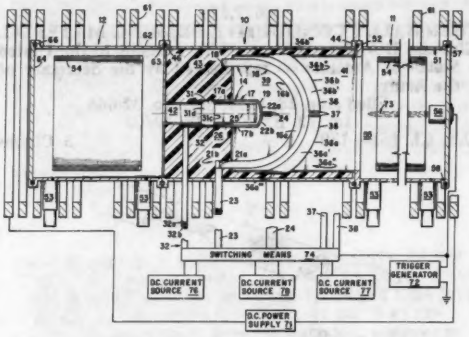
Paper of improved dry strength is obtained when a normally liquid and water-insoluble polysalt coacervate (wherein one of the polymer components is weakly ionic) which has been rendered water-soluble by addition of an ionization suppressor is added to a papermaking fibrous suspension under conditions such that the coacervate is precipitated as colloidal droplets. The droplets are deposited on the fibers, and the fibers are processed into paper in usual manner.

3,677,889

MAGNETIC COMPRESSION CONTROLLED THERMONUCLEAR REACTOR

Frederic H. Coensgen, Pleasanton, and William E. Nexsen, Jr., Danville, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed July 8, 1970, Ser. No. 53,056
Int. Cl. G21b *1/00*
U.S. Cl. 176—3 9 Claims



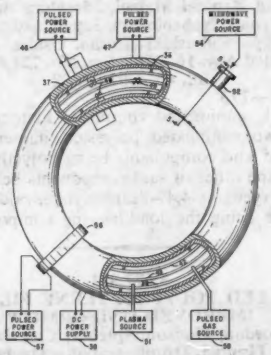
Thermonuclear reactor utilizing a magnetic coil structure including a pair of intermeshed C-shaped electromagnetic coils (Yin-Yang configuration) to produce a magnetic confinement zone. Plasma is produced in a pulsed plasma source and is directed by magnetic fields into the region of said containment zone. A trapping field is produced by means of a second pair of C-shaped electromagnet coils encompassing the first set to trap plasma in said region. The first set of coils is then energized to contain and compress the trapped plasma thereby densifying and heating the plasma to a high temperature.

3,677,890

PLASMA HEATING AND DENSIFICATION IN AXISYMMETRIC TOROIDAL PLASMA CONFINEMENT DEVICES

Charles W. Hartman, Alamo, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed Apr. 23, 1971, Ser. No. 136,927
Int. Cl. G21b *1/02*
U.S. Cl. 176—5 8 Claims



A two-stage process and apparatus for generating and confining a hot, dense plasma for achieving controlled thermonuclear fusion in an axisymmetric toroidal confinement device by first trapping an electron plasma in a closed minimum-|B| magnetic mirror confining field region of the device and raising some to relativistic temperatures by electron-cyclotron resonance microwave heating,

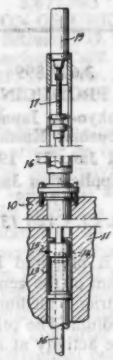
and thereafter injecting a cold dense pulse of neutral gaseous thermonuclear fuel into the confining field region for interaction with the hot electrons therein in a collisional heat transfer mode productive of ion heating to multi-kev. temperature with a very high plasma density of the order of 10^{13}/cm.^{3} to 10^{14}/cm.^{3}.

3,677,891

ANTIJAM SLIDING SEAL STRUCTURE

Pierre M. Tschamper, Lisle, Ill., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed June 16, 1971, Ser. No. 153,655
Int. Cl. G21c 7/00
U.S. Cl. 176—36 R 4 Claims



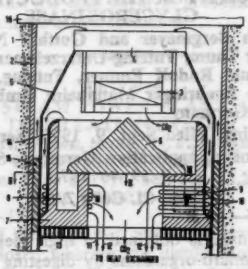
The dynamic seals of a reactor control rod are supported by a collapsible seal tube. If the control rod is frozen to the seals, the force exerted on the control rod by the drive motor is sufficient to cause collapse of the seal tube. As the seal tube collapses, the structure supporting the seals is driven against a striking surface. The impact force developed when the seal support structure hits the striking surface is sufficient to break the control rod loose from the dynamic seals.

3,677,892

COLLECTING DEVICE FOR COOLING REACTOR CORE FRAGMENTS IN A FAST BREEDER REACTOR

Hans-Peter Schabert, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed May 12, 1969, Ser. No. 823,551
Claims priority, application Germany, May 14, 1968, P 17 64 306.0
Int. Cl. G21c 1/02, 19/32
U.S. Cl. 176—40 8 Claims



In a fast breeder reactor provided with a substantially downwardly flowing primary gas coolant and having a reactor core and, located therebelow, a device for separating and a device for collecting reactor core fragments dropped from the reactor core, the cooling of nuclear fission fragments by passing the primary coolant of the reactor through the collecting device for cooling the reactor core fragments collected therein.

3,677,893

FUEL ASSEMBLY FOR A LIQUID-METAL-COOLED FAST BREEDER REACTOR

Paul R. Huebotter, Downers Grove, and Thomas R. Bump, Western Springs, Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 29, 1971, Ser. No. 193,952
Int. Cl. G21c 3/32
U.S. Cl. 176—78 5 Claims

A fuel assembly for a liquid-metal-cooled fast breeder reactor includes a bundle of stainless-steel-clad fuel pins enclosed within a stainless-steel coolant duct with a flow separator being disposed in the annulus between the bundle of fuel pins and the coolant duct. The flow separator is spaced away from the coolant duct to provide a coolant channel adjacent to the coolant duct and includes an inner and an outer wall enclosing a chamber filled with liquid-metal coolant. Imperforate springs extending across the chamber between the inner and outer wall yield when the fuel bundle swells and prevent vertical flow of coolant within the chamber. Flow vents are provided in the outer panel to equalize pressure between the interior of the flow separator and the coolant channel and evacuated insulating spaces containing a single layer of screen wire each are provided in the inner wall of the flow separator.

3,677,894

INTERNALLY PRESSURIZED FUEL ELEMENT

Harry M. Ferrari, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 706,291, Feb. 19, 1968, which is a continuation-in-part of application Ser. No. 615,542, Feb. 13, 1967. This application Aug. 14, 1969, Ser. No. 850,198
Int. Cl. G21c 3/18
U.S. Cl. 176—68 10 Claims

A fuel element for a pressurized nuclear reactor comprising a sealed cladding case, nuclear fuel therein and

means for producing an internally pressurized atmosphere so that the fuel element is free standing, and characterized by metal wall cladding having a reduced thickness for conditions of reactor use.

3,677,895

ALKANE UTILIZATION IN FOAM SYSTEM

Saburo Hashimoto, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jan. 22, 1970, Ser. No. 5,004
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 R 20 Claims

A method is described for the culture of microbial cells on hydrocarbons utilizing paraffinic hydrocarbons as the raw material to achieve a highly economic process for the production of protein from hydrocarbons. The culture medium comprises an aqueous foam composition which contains, as the discontinuous gaseous phase, one or both of oxygen and a gaseous hydrocarbon reactant. The culture medium is contained in the continuous aqueous interface surrounding the gaseous reactant in the discontinuous phase. In a typical application, an aqueous medium containing inorganic nutrients, microorganisms, and a foam stabilizer is foamed with methane to provide a foam composition containing approximately 20 volumes methane per liquid volume of the aqueous medium. This foam composition is placed in a fermentation vessel and contacted therein with a vapor stream containing oxygen, e.g., air, for a period of about 1.5 to 5 hours, sufficient to permit the microorganism content of the aqueous medium to approximately double in weight. Alternatively, a similar foam with air in the discontinuous phase is also formed and the two foams are intimately mixed. The foam composition is removed from the fermentation vessel and the bacterial cells are concentrated by various solid-liquid separators and finally dried to recover cellular matter containing approximately 60 percent protein.

3,677,896

PROCESS FOR PREPARING CRYSTALLINE MALTOSE

Masashi Kurimoto, Kaname Sugimoto, and Mamoru Hirao, Okayama, Japan, assignors to Hayashibara Company, Okayama, Japan

No Drawing. Filed Nov. 13, 1969, Ser. No. 876,608
Claims priority, application Japan, Nov. 18, 1968, 43/84,261
Int. Cl. C12b *1/00*
U.S. Cl. 195—31 R 4 Claims

Process which comprises preparing a high-purity maltose solution by the use of β-amylase for the amylolysis and also α-1,6-glucosidase which can eliminate from starch the α-1,6-glucoside bond that hampers the amylolysis by the action of β-amylase, concentrating the resulting solution to a massecuite containing maltose crystals, and then spraying the massecuite in a drying column to obtain the final product.

3,677,897

LIVE LACTIC ACID BACTERIA CULTURES AND PROCESS OF PRODUCING SAME

George A. Jeffreys, 219 Valleydale Ave., Salem, Va. 24153

No Drawing. Filed Aug. 31, 1970, Ser. No. 68,520
Int. Cl. C12k *3/00*; A21d *8/04*
U.S. Cl. 195—55 22 Claims

Lactic acid bacteria cultures each comprising a lactic acid bacteria cultured in a nutrient medium, an acetylated monoglyceride coating on said cultured bacteria, and a carrier blended with said coated bacteria, said carrier selected from a group consisting of glucose, modified cellulose, and modified starches.

3,677,898

ACID PROTEASE AND METHOD OF PREPARING THE SAME

Koji Mitsugi, Takashi Nakase, and Yoshisuke Hasegawa, Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed Jan. 27, 1970, Ser. No. 6,276
Claims priority, application Japan, Jan. 31, 1969, 44/7,175
Int. Cl. C12d *13/10*
U.S. Cl. 195—62 7 Claims

An acid protease which is not inactivated by sodium lauryl sulfate and is stable at 50° C. at pH 1.5 to 6.0 for two hours can be recovered from media on which certain yeasts of the genus Rhodotorula weer cultured. It is useful in the hydrolysis of soybean protein and of other proteins.

3,677,899

PROCESS FOR PRODUCING CELLULASE

Masanobu Kawai, Tokyo-to, Japan, assignor to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

No Drawing. Filed Jan. 21, 1970, Ser. No. 4,733
Claims priority, application Japan, Feb. 3, 1969, 44/7,275
Int. Cl. C12d *13/10*
U.S. Cl. 195—66 R 4 Claims

A novel cellulase is prepared by cultivating a wood decaying microorganism of the genera Lampteromyces or Formitopsis in a nutrient medium and recovering the cellulase from the medium. The cellulase so produced has high C_1 and CMC-ase activity at a low optimum pH.

3,677,900

METHOD OF PRODUCING COLLAGENASE WITH A SPECIES OF VIBRIO

Joseph R. Merkel, Emmaus, Pa., assignor to Lehigh University, Bethlehem, Pa.

Filed May 4, 1970, Ser. No. 34,178
Int. Cl. C12d *13/10*; A61k *19/00*
U.S. Cl. 195—66 R 23 Claims

Collagenases or collagenolytic enzymes active against several preparations of Achilles tendon collagen, calfskin collagen and synthetic peptides which are normally attacked by *Clostridium histolyticum* collagenase are prepared by culturing certain marine bacteria, particularly species of Vibrio, Aeromonas and Pseudomonas.

3,677,901

PROCESS FOR THE PRODUCTION OF GLYCEROKINASE

Hans Ulrich Bergmeyer and Gotthilf Naher, Tutzing, Waldemar Thum, Tutzing-Unterzeismering, and Albert Lauerer and Rudolf Emmer, Tutzing, Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

No Drawing. Filed Sept. 9, 1970, Ser. No. 70,927
Claims priority, application Germany, Sept. 11, 1969, P 19 46 137.1
Int. Cl. C07g *7/028*
U.S. Cl. 195—66 R 17 Claims

Glycerokinase is obtained in high yield and in stable form from micro-organisms by digesting dried micro-organisms by high pressure dispersion, subsequently subjecting same to a protamine precipitation, separating the precipitate formed and working up the filtrate in known manner with the use of an anion exchanger based on cellulose or dextran.

3,677,902
PREPARATION OF AMYLOGLUCOSIDASE
Knud Aunstrup, Hvidovre, Denmark, assignor to Novo Terapeutisk Laboratorium A/S, Copenhagen, Denmark
No Drawing. Filed June 21, 1966, Ser. No. 559,085
Claims priority, application Great Britain, July 7, 1965, 28,903/65
Int. Cl. C12d *13/10*
U.S. Cl. 195—66 R 4 Claims

A process of producing amyloglucosidase free of any detectable amounts of transglucosidase wherein a strain of *Aspergillus niger* v. Tieghem selected from the group CBS No. 262.65, CBS No. 263.65 and CBS No. 103.66 or a natural or artificial mutant or variant thereof is subjected to submerged growth in a nutrient medium.

3,677,903
DETERMINATION OF URICASE ACTIVITY
Donald L. Bittner, P.O. Box 18007, San Francisco, Calif. 94118
Filed May 19, 1969, Ser. No. 825,678
Int. Cl. G01n *31/14*
U.S. Cl. 195—103.5 R 6 Claims

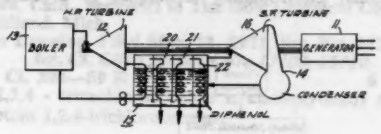
A method for determining the extent of oxidative activity of the enzyme uricase on human serum and other biological fluids, useful for analyzing the presence and amount of uric acid. Uricase is added to the serum or other fluid in quantities and in a buffer system suitable for digestion of substantially all uric acid present. At the same time, the enzyme catalase is added to destroy any hydrogen peroxide generated as a by-product in the urate oxidation by uricase. A color indicator sensitive to the presence and amount of oxidizing and reducing substances is added before and after the uricase digestion, and the colorimetric differential between the samples provides a measure of the uricase activity.

3,677,904
PETRI DISH INCLUDING A CHAMBER FOR A STERILIZED SPECIMEN-SPREADING ELEMENT AND PROCESS FOR USING THE PETRI DISH
James E. Fitzgerald, Hawthorne, Calif., assignor to North American Rockwell Corporation
Filed Nov. 20, 1969, Ser. No. 878,479
Int. Cl. C12k *1/00*
U.S. Cl. 195—103.5 R 12 Claims

A petri dish is provided with a separate chamber for a sterilized ball. Prior to use, an agar layer is deposited in the dish and a specimen sample, to be spread on the layer, is placed in the chamber with the ball. A magnet is positioned over the chamber for pulling the ball covered by a film of the specimen from the chamber. The magnet places the ball and specimen at a predetermined location on the agar layer. The dish is rotated relative to the ball for spreading the specimen in a non-overlapping pattern on the agar surface. Afterwards, the ball is returned to the chamber and the agar layer is processed to incubate the micro-organisms of the specimen.

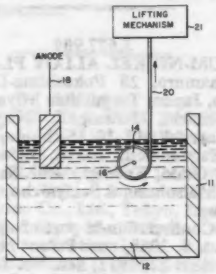
3,677,905
COMBINED STEAM POWER PLANT AND WATER DISTILLATION SYSTEM
Dale H. Brown, Scotia, N.Y., assignor to General Electric Company
Filed May 6, 1970, Ser. No. 35,208
Int. Cl. B01d *3/02*
U.S. Cl. 202—172 2 Claims

A combined steam power plant and water distillation system is disclosed wherein the distillation system is located between the first and last stages of the steam turbine used in the power plant. The distillation system does not fully cool the steam; rather, the steam is returned to the last turbine stage where it does work and produces power as it expands to the conventional turbine condenser pressure. In an alternate embodiment, the last stage of the turbine is a secondary fluid turbine. In this embodiment, the secondary fluid, which has a greater vapor density



than steam at the relatively low temperature of the last stage, is vaporized by the last condensation stage of the distillation system.

3,677,906
METHOD AND APPARATUS FOR PRODUCING THIN COPPER FOIL
Chih-Chung Wang, Lexington, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.
Filed Dec. 17, 1970, Ser. No. 99,035
Int. Cl. C23b *7/02*; B01k *1/00*
U.S. Cl. 204—13 7 Claims



A process and apparatus for producing thin copper foils by electroplating the copper onto a rotating drum which is connected as a cathode. The surface of the rotating drum is rhenium.

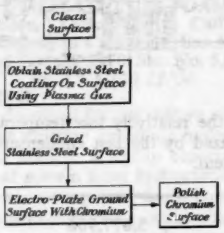
3,677,907
CODEPOSITION OF A METAL AND FLUOROCARBON RESIN PARTICLES
Henry Brown, Huntington Woods, and Thaddeus W. Tomaszewski, Dearborn, Mich., assignors to The Udylite Corporation, Warren, Mich.
No Drawing. Filed June 19, 1969, Ser. No. 834,908
Int. Cl. C23b *5/48, 5/20*
U.S. Cl. 204—16 18 Claims

Fine particles of fluorocarbon resins such as Teflon particles can be readily codeposited with metals when they are dispersed in aqueous plating baths, when there is also precent in the baths a fluorocarbon surfactant such as perfluoro n-octanoic acid, perfluoro n-octyl sulfonic acid, perfluoro p-ethyl cyclohexyl sulfonic acid, or their salts. Such 2-phase composite plates have good anti-seizing and anti-friction properties.

3,677,908
METAL PLATING PRODUCT AND PROCESS
Robert J. Sperl, 2319 Pennsylvania Ave., Wilmington, Del. 19806
Filed Nov. 12, 1970, Ser. No. 88,936
Int. Cl. C23b *5/06, 5/48*; C23c *11/00*
U.S. Cl. 204—38 B 6 Claims

An aluminum article may be provided using electroplating with a continuous, hard, abrasive resistant surface

by first cleaning the article and roughening its surface and then plasma-plating the roughened surface with a metal compatible to electroplating, such as stainless steel, and coating the final steel surface with chromium using the conventional electroplating techniques to produce the


Clean Surface
Obtain Stainless Steel Coating On Surface Using Plasma Gun
Grind Stainless Steel Surface
Electro-Plate Ground Surface With Chromium
Polish Chromium Surface

finished product. The product thus created can be used in dynamic systems using far less motive power and lower bearing loads than would otherwise be required when using articles made from conventional, heavier ferrous or non-ferrous materials.

3,677,909

PALLADIUM-NICKEL ALLOY PLATING BATH

Katsumi Yamamura, 28 Fukushima-Danchi, Suwa-shi, Nagano-ken, Japan; Tsugumitsu Miyasaka, 5892 Takei, Shimosuwa-machi, Suwa-gun, Nagano-ken, Japan; Shinichi Hayashi, 17–10, 5-chome, Forikiri, Katsushika-ku, Nagano-ken, Tokyo, Japan; Masao Yamamoto, 1148 Osato, Koshigaya-shi, Saitama-ken, Japan; and Yukio Matsubara, 6 Sekiya-cho, Senju, Adachi-ku, Tokyo, Japan

No Drawing. Continuation-in-part of application Ser. No. 695,576, Jan. 4, 1968, now Patent No. 3,580,820. This application Apr. 22, 1971, Ser. No. 136,588
Claims priority, application Japan, Jan. 11, 1967, 42/1,868
Int. Cl. C23b 5/32, 5/46
U.S. Cl. 204—43 3 Claims

A palladium-nickel alloy plating bath is formed of a solution of a palladium salt and a nickel salt in ammonia, and a brightener in the nature of a sulfonamide is added to the bath in which a metal is plated for approximately 30 minutes at a pH between 7 and 10, temperature between 15° C. and 40° C., and a cathode current density of 0.5 to 1.5 a./dm.^{2} without agitation.

3,677,910

TIN-PLATING METHOD AND ELECTROLYTE

Wilfred Pickles, Hazel Grove, Stockport, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Mar. 6, 1969, Ser. No. 804,982
Claims priority, application Great Britain, Mar. 9, 1968, 11,614/68
Int. Cl. C23b 5/14, 5/46
U.S. Cl. 204—54 R 12 Claims

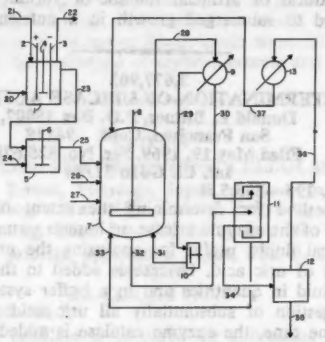
A method of tin-plating is disclosed which comprises electrodepositing, on a surface to be plated, tin from an acid plating bath containing a condensation product of phenol and aliphatic polyol containing from 2 to 8 hydroxyl groups, at least one of which hydroxy groups pertains preferably to a divalent hydroxy methylene group, the number of carbon atoms of the polyol varying preferably from 3 to 12 carbon atoms. Use of ethylene oxide addition products of said condensation products and sulfated derivatives of said condensation products and said ethylene oxide addition products is also disclosed.

3,677,911

CATALYST FOR POLYMERIZATION OF OLEFINIC COMPOUNDS

Edward H. Mottus, Ballwin, and Morris R. Ort, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.

Application Mar. 2, 1967, Ser. No. 621,036, which is a continuation-in-part of application Ser. No. 539,662, Apr. 4, 1966. Divided and this application Mar. 10, 1970, Ser. No. 23,110
Int. Cl. B01k 3/00
U.S. Cl. 204—59 QM 17 Claims



An electrolytic process is described for making certain bis-(halometal)methanes such as bis(dichloroaluminum) methane, $Cl_2AlCH_2AlCl_2$, which is a new compound, and these compounds can be combined with transition metal compounds such as $VOCl_3$ to make very active catalysts for polymerizing olefinic compounds such as ethylene. In the electrolytic process boron, a Group II, Group III–A or Group IV–A metal, e.g., aluminum, is used as an anode with an electrolyte such as $HOAlCl_2$ in the presence of a methylene dihalide such as CH_2Cl_2 or a gem dihalide which does not readily dehydrohalogenate or alkylate. It is preferred to carry out the electrolysis in the presence of ethylene or another olefinic compound to promote conductivity. Also, it is preferred that all reactants be substantially free of water, except for small known amounts of water which may be added to promote electrolysis. Also, it is preferred to blanket the electrolysis with ethylene which also serves to promote conductivity, or an inert gas to exclude moisture, oxygen and other undesirable materials. The catalysts polymerize olefinic compounds to liquid or solid polymers depending on the particular catalyst used and the olefin being polymerized. The catalysts are promoted or modified by small amounts of water or other electron donor compounds.

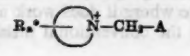
3,677,912

NICKEL ELECTROPLATING AND ELECTROLYTES THEREFOR

Frank Passal, Detroit, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

No Drawing. Continuation-in-part of application Ser. No. 587,393, Oct. 18, 1966. This application Sept. 30, 1970, Ser. No. 76,987
Int. Cl. C23b 5/08, 5/46
U.S. Cl. 204—49 13 Claims

In accordance with certain of its aspects, the novel process of this invention for electroplating nickel may comprise electrodepositing nickel from an aqueous nickel electroplating bath containing (a) as a first primary brightener an effective amount of a water-soluble acetylenic compound, and (b) as a second primary brightener, an effective amount of a compound having as cation:



(I)

wherein

is a pyridine, quinoline, or isoquinoline nucleus; *a* is 0–5; A is —CX=CHX or —C≡CH; X is an active halide; and R* is a substituent selected from the group consisting of alkyl, preferably having 1–4 carbon atoms, hydroxy-alkyl preferably having 1–4 carbon atoms, halogen, alkoxy, carboxyl, carbalkoxy, acetyl, benzyl, sulfo, carboxamido, and cyano.

3,677,913

NICKEL PLATING

Frank Passal, Detroit, Mich., assignor to M & T Chemicals, Inc., Greenwich, Conn.

No Drawing. Filed Apr. 1, 1971, Ser. No. 130,479
Int. Cl. C23b *5/08, 5/46*
U.S. Cl. 204—49 **12 Claims**

The novel process of this invention for electroplating a semi-bright sulfur-free, nickel plate onto a basis metal comprising passing current from an anode to a basis metal cathode through an aqueous acidic nickel plating solution containing at least one nickel compound providing nickel ions for electroplating of nickel, and including as cooperating semi-bright additives: (a) the aliphatic acetylenic compound 3-hexyne-2,5-diol, and (b) a compound containing an oxyomegasulfohydrocarbon-di-yl coumarin anion wherein the hydrocarbon - di - yl moiety contains at least two carbon atoms and wherein the oxyomegasulfohydrocarbon-di-yl group is substituted on the carbocyclic nucleus of the coumarin group.

3,677,914

PROCESS FOR THE MANUFACTURE OF BUTADIENE DERIVATIVES

Hans Schaefer, Eddigehausen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Aug. 24, 1970, Ser. No. 66,573
Claims priority, application Germany, Sept. 1, 1969, P 19 44 278.5
Int. Cl. C09b *29/06*
U.S. Cl. 204—59 R **8 Claims**

Process for the manufacture of butadiene derivatives by the electrolysis of olefinically unsaturated compounds of the general formula:

where R stands for an aromatic radical and R^1 for an aliphatic radical, in the presence of lower aliphatic alcohols and an electrolyte salt, graphite electrodes being used for effecting the electrolysis.

3,677,915

PRODUCTION OF OCTADIENE AND DODECATRIENES

Hans Schaefer, Eddigehausen, Germany, assignor to Badische Anilin- & Soda-Fabrik, Aktiengesellschaft, Ludwigshafen am Rhine, Germany

No Drawing. Filed Aug. 26, 1970, Ser. No. 67,225
Claims priority, application Germany, Sept. 1, 1969, P 19 44 279.6
Int. Cl. C07b *29/06*
U.S. Cl. 204—59 R **8 Claims**

Production of octadienes and dodecatrienes by electrolysis of a butadiene in the presence of a lower aliphatic alcohol and an electrolyte salt using graphite electrodes.

3,677,916

ELECTROLYTIC REDUCTION OF 1,2,3,4-TETRACHLOROBENZENE TO OBTAIN 1,2,4-TRICHLOROBENZENE

James N. Seiber, Davis, and Robert R. Stringham, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Mar. 11, 1971, Ser. No. 123,464
Int. Cl. C07b *29/06*; C07c *17/00, 25/10*
U.S. Cl. 204—59 R **6 Claims**

1,2,3,4 - tetrachlorobenzene is electrolytically reduced to obtain 1,2,4-trichlorobenzene.

3,677,917

ELECTRODE COATINGS

Aleksandrs Martinson, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Sept. 8, 1970, Ser. No. 70,507
Int. Cl. B01r *3/04*; C01d *1/08*
U.S. Cl. 204—99 **7 Claims**

Electrocatalytic surfaces suitable for use as anodes in the electrolysis of aqueous alkali metal chlorides are prepared by coating a substrate with a palladium oxide surface containing a film-forming metal oxide, small quantities of an oxide of a second platinum group metal, and an oxide of an iron group metal. The resulting electrodes have a low overvoltage and are long lived in the electrolytic cell environment.

3,677,918

METHOD FOR DIRECTLY ELECTROCHEMICALLY EXTRACTING GALLIUM FROM A CIRCULATING ALUMINATE SOLUTION IN THE BAYER PROCESS BY ELIMINATING IMPURITIES

Shigenobu Miyake, Tokyo, Japan, assignor to Chuo Tatemono Co., Ltd., Tokyo, Japan

No Drawing. Filed Sept. 18, 1969, Ser. No. 859,202
Claims priority, application Japan, Oct. 21, 1968, 43/76,661; Jan. 21, 1969, 44/4,313
Int. Cl. C22d *1/00*
U.S. Cl. 204—105 R **7 Claims**

Gallium is electrochemically recovered from a circulating aluminate solution in the Bayer process for producing alumina directly without any precipitate formation, filtration and redissolution for the purpose of changing the concentration of major component. Gallium is electro-deposited at cathode surface when the solution is used as an electrolyte.

3,677,919

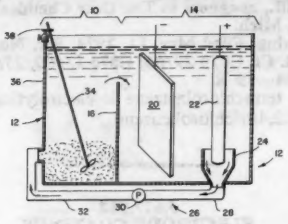
ELECTROLYTIC PROCESS AND APPARATUS FOR RECOVERING NICKEL FROM ASBESTOS ORE

Richard Payson Fowler, Somerville, N.J., assignor to Johns-Manville Corporation, New York, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,835
Int. Cl. C22d *1/14*; C23b *5/08*
U.S. Cl. 204—113 **5 Claims**

Nickel is leached from asbestos ore material by a solution of iodine in a liquid solvent for iodine, such as methyl alcohol. Direct current is applied to the resulting nickel containing solution to deposit a nickel compound onto the cathode of an electrolytic cell where it can be collected, and to deposit iodine molecules at the anode. The deposited iodine molecules redissolve in the solvent solution to form a heavy fraction which can be withdrawn from the electrolytic cell and reused in the leaching step. Apparatus is provided for recovering nickel from a finely divided asbestos ore material feed in accordance with the invention. The apparatus includes a leaching vessel containing a solution of iodine in a solvent, an electrolytic cell, conduit means connecting the electrolytic cell and the leaching vessel, collection means posi-

tioned below the anode of the electrolytic cell for recovering an iodine-rich solution from the electrolytic cell



and recycle conduit means for recycling the iodine-rich solution to the leaching vessel.

3,677,920

PHOTOPOLYMERIZABLE DIISOCYANATE MODIFIED UNSATURATED POLYESTER CONTAINING ACRYLIC MONOMERS

Tsunetoshi Kai and Takeaki Hagihara, Asaka-shi, Saitama-ken, and Teruhisa Ishido, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed June 23, 1969, Ser. No. 835,726
Claims priority, application Japan, July 6, 1968, 43/46,991
Int. Cl. C08d *1/10*; C08f *1/10*
U.S. Cl. 204—159.15 **14 Claims**

A photopolymerizable composition comprising:

(I) A diisocyanate modified unsaturated polyester prepared by reacting a diisocyanate with an unsaturated polyester at a mol ratio of 1:2 to 1:1, said unsaturated polyester having terminal groups selected from carboxyl and hydroxy groups, having an average molecular weight of about 2,000 to 50,000, and containing about 1×10^{-4} to 2×10^{-3} mole of ethylenic unsaturation per gram of the unsaturated polyester,

(II) About 10 to 80 weight percent, based upon the total weight of the composition, of at least one ethylenically unsaturated monomer, different from the unsaturated polyester, which is addition-copolymerizable with the diisocyanate modified unsaturated polyester (I); and

(III) About 0.001 to 10 weight percent, based upon the total weight of the composition, of a photopolymerization initiator. This photopolymerizable composition is especially effective for the production of a variety of laminated articles and flexographic printing plates among a variety of image-making articles.

3,677,921

POLY(1,12 - DODECAMETHYLENE PYROMELLITIMIDE) AND POLY(1,13-TRIDECAMETHYLENE PROMELLITIMIDE) AND RADIATION-CROSSLINKED PRODUCTS THEREOF

Edward C. Stivers, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

No Drawing. Continuation-in-part of application Ser. No. 760,659, Sept. 18, 1968. This application Oct. 29, 1970, Ser. No. 85,272
Int. Cl. C08g *20/32*
U.S. Cl. 204—159.19 **15 Claims**

Thermoplastic polyimides derived from straight chain alkylene diamines and pyromellitic anhydride are prepared and fabricated into useful articles, e.g., wire insulation and film for use as a base for printed circuits. The polyimides can be crosslinked to improve their high temperature properties.

3,677,922

POLYMERIZATION OF TETRAOXANE IN THE PRESENCE OF AN ACETAL AND A SULFUR INITIATOR

Akihiko Ito and Yoshiaki Nakase, Takasaki, Katsumi Kojima, Oimachi, Masaru Yoshida, Takasaki, Tadashi Iwai, Kanagawa-ken, Koichiro Hayashi, Sapporo, and Seizo Okamura, Kyoto, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

No Drawing. Filed June 19, 1970, Ser. No. 47,866
Claims priority, application Japan, June 20, 1969, 44/48,285
Int. Cl. C08d *1/00*; C08f *1/16, 3/40*
U.S. Cl. 204—159.21 **21 Claims**

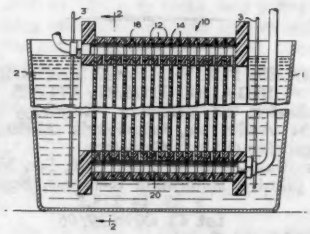
A thermally stabilized oxymethylene polymer is obtained by polymerizing tetraoxane in the presence of an acetal and a polymerization initiator selected from the group consisting of sulfur and an organic sulfur compound. Irradiation by an ionizing radiation or an actinic light can advantageously be employed in the polymerization. Said thermal stability is further improved, when tetraoxane is polymerized by using a specific combination of an acetal such as methylal, ethylal, 1,3-dioxolane, 1,3-dioxane, etc. and an initiator such as thiiranes, thiocyanates, isothiocyanates, ethylenethiourea, trithianoxides, etc.

3,677,923

ELECTROOSMOTIC AND ELECTRODIALYSIS CONCENTRATION, PURIFICATION, AND DESALTING

Milan Bier, 5341 E. 7th St., Tucson, Ariz. 85711

Filed Apr. 15, 1968, Ser. No. 721,296
Int. Cl. B01d *13/02*; B01k *5/00*
U.S. Cl. 204—180 P **15 Claims**



Hog cholera serum and its fractions, and generally aqueous colloidal solutions and suspensions are concentrated, purified, and/or desalted by subjecting them to electroosmosis against an aqueous suspension containing a polyionic substance.

3,677,924

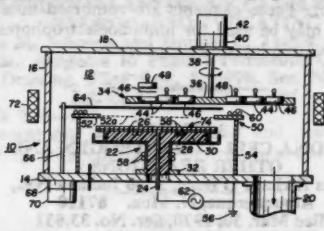
RF SPUTTERING METHOD

John H. Cash, Jr., Richardson, and James A. Cunningham, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Original application June 5, 1967, Ser. No. 643,613, now Patent No. 3,528,906, dated Sept. 15, 1970. Divided and this application Mar. 13, 1970, Ser. No. 24,410
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **5 Claims**

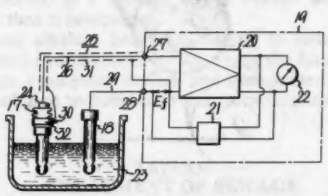
A method and system for RF sputtering thin conducting and thin insulating films on a semiconductor substrate using a first electrode for supporting a source material and an apertured second electrode. The RF voltage is applied across the first and second electrodes. The substrate is supported by a third electrode and exposed to atoms sputtered from the source which pass through the apertured second electrode. The third electrode may be at the same potential as the second electrode, or at a different potential to carry out bias sputtering. The system includes multiple pairs of first and second electrodes for multiple film deposition without breaking vacuum and a rotating

third electrode which moves the substrates past the apertures in the second electrodes during sputtering to elimi-



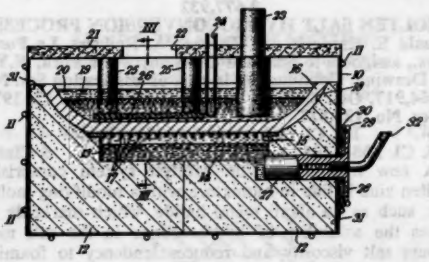
nate shadowing and to further enhance cooling. A shutter is provided to prevent crosscontamination of the idle sources and the film being deposited on the substrate.

3,677,925
APPARATUS FOR MEASURING pH
Tokutaro Tamate, Eiichi Yagi, and Hisayuki Ikeda, Tokyo, Japan, assignors to Kabushikikaisha Yokogawa Denki Seisakusho, Tokyo, Japan
Filed July 22, 1970, Ser. No. 57,163
Int. Cl. G01n *27/36*
U.S. Cl. 204—195 R **3 Claims**



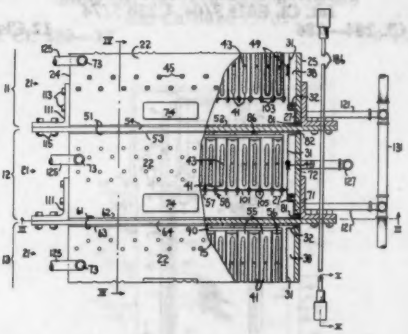
A glass electrode having support tube means, an inner electrode disposed therein, a cap formed of an insulating material and fixed on the top of the support tube means, a glass electrode terminal provided on the cap and connected with the inner electrode, a guard ring fixed on the periphery of the cap and a guard ring terminal, in which a negative feedback voltage from a negative feedback amplifier is impressed to the guard terminal, the negative feedback amplifier amplifying a signal derived at the glass electrode terminal.

3,677,926
CELL FOR ELECTROLYTIC REFINING OF METALS
Walter Dennis Davis, Uxbridge, England, assignor to Associated Lead Manufacturers Limited, London, England
Filed June 16, 1970, Ser. No. 46,659
Int. Cl. C22d *3/02, 3/20*
U.S. Cl. 204—243 R **6 Claims**



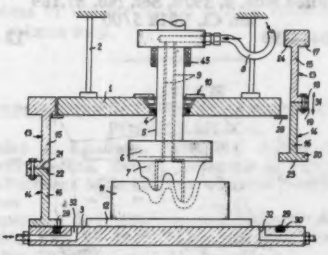
A fused salt cell for the electrolytic refining of metals, having a lower molten metal cathode, an upper molten metal anode, a flux-impregnated porous diaphragm disposed beneath and in contact with the anode and a layer of molten flux on top of the anode.

3,677,927
ELECTROLYZER
Carl W. Raetzsch and Hugh Cunningham, Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Nov. 23, 1970, Ser. No. 91,911
Int. Cl. B01k *3/10*
U.S. Cl. 204—258 **8 Claims**



An electrolyzer for the electrolysis of brine is disclosed. The electrolyzer comprises a plurality of electrolytic cells mechanically and electrically connected in series. The cathodes of any individual cell in the electrolyzer are fingers connected to opposite interior surfaces of the cell. The anodes are blades mechanically connected to the back wall of the cell and electrically connected to the cathodes of the prior cell in the circuit.

3,677,928
MACHINE FOR ELECTROCHEMICALLY MACHINING WORKPIECES
Jean Fleury, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, France
Filed July 20, 1970, Ser. No. 56,473
Claims priority, application France, Aug. 19, 1969, 6928435
Int. Cl. B23p *1/04, 1/12*
U.S. Cl. 204—224 **10 Claims**



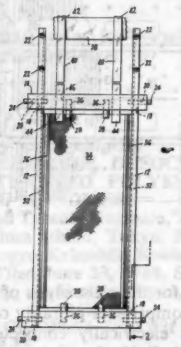
A machine for electrochemically shaping workpieces, of the type comprising a vertical tool-electrode and a pressure chamber comprising a base member carrying the workpiece and a tool holder having formed therein at least one axial electrolyte passage duct, characterized in that the pressure chamber comprises a fixed roof formed with a central opening provided with a seal for the fluid-tight passage of a tool-holder sliding column and a vertically movable lateral wall surrounding said roof, said

tool-electrode and said workpiece, means for sealing the joints on the one hand between the upper portion of said lateral wall and the outer edge of said roof, and on the other hand between the lower portion of said lateral wall and said base member.

3,677,929
ADJUSTABLE FRAME FOR THIN SHEET ELECTRODES

George Ralph Young, Jr., Woodbury, Conn., assignor to American Chemical & Refining Company Incorporated, Waterbury, Conn.

Filed Aug. 19, 1970, Ser. No. 65,117
Int. Cl. B01r *3/04*; C23b *5/74*
U.S. Cl. 204—286 12 Claims

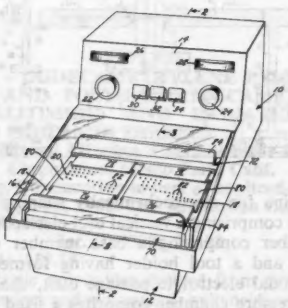


An electrode assembly includes an adjustable frame having a thin sheet electrode mounted therewithin. The frame comprises parallel side bars and end members extending therebetween, with at least one of the end members being slidably engageable with the side bars to vary the area defined within the frame. An electrically conductive connector is provided on the electrode for connection to a current source, and means is included to support the assembly within a plating tank.

3,677,930
ELECTROPHORESIS TESTING APPARATUS

Alex Meshbane, Syosset, and Frank Vilardi, Nesconset, N.Y., assignors to Savant Instruments, Inc., Hicksville, N.Y.

Filed Nov. 5, 1970, Ser. No. 87,169
Int. Cl. B01k *5/00*
U.S. Cl. 204—299 12 Claims

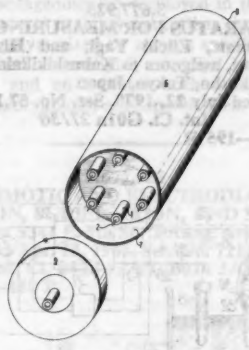


A high voltage thermoelectrically cooled electrophoresis testing apparatus utilizing flat plate electrophoresis. The apparatus is an integrated unit including a high voltage supply, flat plate electrophoresis system and a thermoelectric cooler. These elements are combined in a single housing and may be used for immunoelectrophoresis and gel, paper, and thin layer electrophoresis.

3,677,931
CORONA CELL FOR NITROGEN AND OTHER REACTIONS

Louis Richard O'Hare, 2700 Indiana NE., Albuquerque, N. Mex. 87110

Filed Mar. 30, 1970, Ser. No. 33,831
Int. Cl. B01k *1/00*
U.S. Cl. 204—312 3 Claims



A concentric-electrode type of electric chemical reactor cell using high voltages of A.C. current between a central wire and an outer insulated metallic cylinder, such as in an ozone generator, is adapted for achieving higher energy gas state chemical reactions by the use of higher voltages and fields thereby producing chemically reactive ionized species which are unattainable and undesirable from the standard ozone generator. The A.C. voltage between the electrodes is provided with a D.C. bias of such amplitude as to insure periods of time when there is a greater number of ions in the cell having a charge that is of the same electric sign as the sign on the central ionizing wire for the chemical advantage of reacting that ionized species when the reacting species is more chemically reactive in its ionized form than in its electrically neutral form, and finally the capacitive reactance of the cell is made part of a resonant circuit with the secondary of the current supply transformer to insure a favorable power factor and efficient operation.

3,677,932
MOLTEN SALT HYDROCONVERSION PROCESS

Donald E. Hardesty and Thomas A. Rodgers, La Porte, Tex., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 764,917, Oct. 3, 1968. This application Mar. 12, 1971, Ser. No. 123,827
Int. Cl. C10g *13/08, 23/02, 29/12*
U.S. Cl. 208—108 5 Claims

A new hydroconversion catalyst system comprising molten zinc halide in admixture with a modifying molten salt, such as an alkali metal halide, which markedly reduces the solubility of hydrocarbons in the salt melt, lowers salt viscosity and reduces tendency to foaming, all these changes in salt property being especially advantageous for practical applications in continuous hydrocarbon conversion processes.

3,677,933
MOLYBDENUM-ANTIMONY CATALYSTS FOR HYDROCARBON TREATING

Marvin M. Johnson and Donald C. Tabler, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Sept. 8, 1970, Ser. No. 70,503
Int. Cl. C10g *13/02, 13/04*
U.S. Cl. 208—109 9 Claims

Hydrocarbons are hydrocracked and desulfurized by contacting with supported molybdenum-antimony catalysts.

3,677,934
PROCESS FOR PREPARING PURIFIED LINEAR ALKYLATE BOTTOM

Kanji Majima and Goro Morita, Wakayama-shi, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

No Drawing. Filed Mar. 6, 1969, Ser. No. 804,999
Int. Cl. C10g *21/02*
U.S. Cl. 208—323 2 Claims

An oil soluble alkylarylsulfonate is prepared by sulfonating a linear alkylate bottom with either

(a) 1.2—2 moles of SO_3, or
(b) 3—10 moles of fuming sulfuric acid

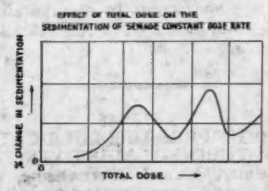
per one mole of the linear alkylate bottom based on the average molecular weight thereof. The reaction mixture is then dissolved in a mineral oil, is washed with sulfuric acid and then is neutralized.

A linear alkylate bottom is treated to remove highly unsaturated hydrocarbons by dissolving the linear alkylate bottom in a nonpolar solvent and then subjecting the resulting solution to countercurrent extraction using a polar solvent.

3,677,935
TREATMENT OF SEWAGE

Hal R. Spragg, Phoenix, Ariz., assignor to the United States Atomic Energy Commission

Filed May 4, 1964, Ser. No. 364,376
Int. Cl. C02c *1/02*
U.S. Cl. 210—3 5 Claims

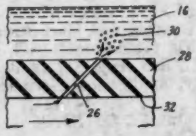


A method of treating sewage by irradiationg it with 10^3 to 10^6 rad of ionizing radiation from X-ray or gamma ray sources, thereby increasing the sedimentation rate of the sewage and degrading organic sewage components, especially synthetic detergents. Radioactive isotopes are the preferred sources of the ionizing radiation.

3,677,936
LIQUID TREATMENT METHOD

Abraham G. Bastiaanse, 162 Main St., Unionville, Conn. 06085

Filed Mar. 10, 1971, Ser. No. 122,749
Int. Cl. C02c *1/02*
U.S. Cl. 210—15 3 Claims

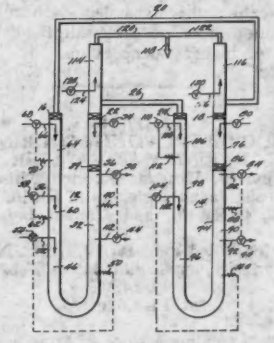


A system for treating liquid bodies with a gas employs a diffusion member that comprises a hose of relatively resilient material having formed therein a multiplicity of minute, normally closed perforations. The perforations extend through the wall of the hose at an angle that is at least 25 degrees from normal to the surface thereof, and they are produced with the removal of substantially no material.

3,677,937
SPLIT LOOP CONTACTOR

Irwin R. Higgins and Jack D. Ferner, Oak Ridge, Tenn., assignors to Chemical Separations Corporation, Oak Ridge, Tenn.

Filed Feb. 10, 1970, Ser. No. 10,208
Int. Cl. B01d *15/02*
U.S. Cl. 210—19 3 Claims



A continuous cyclic process for contacting ion exchange resin with two or more liquids in a plurality of serially connected U-shaped columns includes introducing a first liquid into a first U-shaped column loop whereupon a component thereof is absorbed on the ion exchange resin therein. A second liquid is introduced into a second column which contains a portion of the ion exchange resin previously contained in the first column loop serially connected therewith, said portion of the ion exchange resin having absorbed thereon the component from said first liquid. The second liquid has a first component exchangeable with the component from the first liquid on the ion exchange resin and a second component combinable with the component from the first liquid which is released from the ion exchange resin during the exchange. A product which is the combination of the second component of the second liquid and the released component of the first liquid is then removed from the second column loop.

3,677,938
CHROMATOGRAPHIC SEPARATION WITH POROUS SILICA

Madeleine A. Le Page, Paris, and Albert J. de Vries, Chevilly-la-Rue, France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Chateau Neuilly-sur-Seine, France

No Drawing. Continuation-in-part of application Ser. No. 616,463, Feb. 16, 1967. This application Mar. 18, 1970, Ser. No. 20,849
Claims priority, application France, Feb. 24, 1966, 50,950
Int. Cl. B01d *15/08*
U.S. Cl. 210—31 13 Claims

This invention is addressed to the chromatographic separation process using columns filled with porous silica particles in which the porous silica particles are formed by calcination of silica gel at temperatures within the range of 400–1000° C. with the silica gel containing foreign atoms such as alkali metal cations and acidic anions such as sulfur, etc.

3,677,939
PROCESS FOR THE USE OF VERMICULITE IN WASTE WATER RENOVATION
Arvind S. Patil, 710 Roeder Road, Silver Spring, Md. 20910; John W. Icraus, 3715 Prosperity Ave., Fairfax, Va. 22030; and Jacob Block, 14112 Parkvale Road, Rockville, Md. 20852
No Drawing. Original application Mar. 26, 1968, Ser. No. 715,951. Divided and this application Oct. 30, 1970, Ser. No. 85,719
Int. Cl. B01d *15/00*
U.S. Cl. 210—36 5 Claims
Vermiculite, after having been chemically treated, has enhanced absorptive and coagulative properties, and can be used to remove contaminants occurring in waste waters by removing phosphates from the waste water. The treatment consists of (1) expanding the vermiculite and (2) treating the expanded vermiculite with an aqueous solution of an inorganic salt, the cation of which is in a +2 or higher valence state.

3,677,940
METHOD OF TREATING SCOURING AND DYEING WASTE WATER
Hiroshi Fujimoto, Hirakata-shi, and Mitsugu Fukuda, Takatsuki-shi, Japan, assignors to Kurita Water Industries Ltd., Osaka-shi, and Unitika Ltd., Hyogo-ken, Japan
No Drawing. Filed Feb. 16, 1971, Ser. No. 115,688
Claims priority, application Japan, Feb. 18, 1970, 45/14,345
Int. Cl. C02c *5/02*
U.S. Cl. 210—44 10 Claims
A method of treating a wool scouring waste water and a dyeing waste water which comprises the steps: mixing the scouring waste water and dyeing waste water; adding to the mixed liquid thus prepared a coagulant consisting of an inorganic metallic salt and adjusting the pH to thereby give rise to flocs of metallic hydroxide; further adding an anionic organic coagulant to thereby give rise to aggregation of said flocs; and separating the resulting sludge.

3,677,941
OIL FRACTURING PROPPING AGENTS
Vincent B. Mazzara, Galveston, and Jerome M. Fesperman, Texas City, Tex., assignors to Standard Oil Company, Chicago, Ill.
No Drawing. Continuation of abandoned application Ser. No. 778,012, Nov. 19, 1968, which is a continuation of application Ser. No. 337,719, Jan. 15, 1964. This application Oct. 29, 1969, Ser. No. 872,426
Int. Cl. C21b *43/25*
U.S. Cl. 252—8.55 R 5 Claims
Substantially spherical oil-soluble propping particles for use in fracturing underground oil or gas formations comprise polymerized alicyclic olefinic hydrocarbons containing anti-oxidants which inhibit the formation of oil-insoluble residue in such particles.

3,677,942
FLAME RETARDANT COMPOSITION COMPRISING AN ORGANIC BROMINE COMPOUND, AN ORGANIC PHOSPHATE AND A LEAD SALT
Maria Feiner, Henin Lietard, Michel Gubler, Paris, and Joseph Guillon, Meurchin, France, assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Sept. 10, 1970, Ser. No. 71,238
Claims priority, application France, Sept. 12, 1969, 6931182
Int. Cl. B09k *3/28*
U.S. Cl. 252—8.1 17 Claims
Self-extinguishing plastic materials are prepared by incorporating in the plastic a composition of an organic bromine compound, an organic phosphate and a lead salt.

3,677,943
NOVEL PHOSPHORUS-CONTAINING PYRIMIDINES AND LUBRICANTS CONTAINING SAME
John C. Nnadi, Deptford, N.J., assignor to Mobil Oil Corporation
No Drawing. Filed Dec. 24, 1970, Ser. No. 101,424
Int. Cl. C10m *1/46, 1/48*
U.S. Cl. 252—46.7 9 Claims
The invention provides novel phosphorus-containing aminopyrimidines. Also provided are lubricant compositions containing these products which have improved antioxidant and extreme pressure properties.

3,677,944
POLYPHENYL THIOETHER LUBRICATING COMPOSITIONS
Frank S. Clark, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Dec. 28, 1970, Ser. No. 102,154
Int. Cl. C10m *1/38, 1/30*
U.S. Cl. 252—48.4 5 Claims
Lubricating compositions comprising polyphenyl thioethers, polyphenyl ethers-thioethers or mixtures thereof and containing small amounts of a perfluoro aliphatic dibasic acid have improved lubricating properties. These compositions are useful as lubricants over wide temperature ranges.

3,677,945
STABILIZATION OF LUBRICANTS
Allen K. Sparks, Des Plaines, Ill., assignor to Universal Products Company, Des Plaines, Ill.
No Drawing. Continuation-in-part of application Ser. No. 843,852, July 22, 1969, now Patent No. 3,629,190, which is a continuation-in-part of application Ser. No. 623,805, Mar. 17, 1967, now Patent No. 3,481,978. This application Mar. 12, 1971, Ser. No. 123,820
Int. Cl. C10m *1/54*
U.S. Cl. 252—49.6 6 Claims
Stabilizing lubricants against deterioration during transportation, storage and/or use by incorporating therein a 2-hydrocarbyl-1,3-di-sec-alkyl or di-cycloalkyl-2H-1,3,2-benzodiazoborole.

3,677,946
EXTREME PRESSURE LUBRICATION THROUGH ADDITIVES
Josef Gansheimer, Munich-Obermenzing, and Oswald Schanzer, Munich, Germany, assignors to Dow Corning Corporation, Midland, Mich.
No Drawing. Filed Jan. 2, 1970, Ser. No. 438
Claims priority, application Germany, Jan. 7, 1969, P 19 00 634.9
Int. Cl. C10m *1/36*
U.S. Cl. 252—51.5 A 1 Claim
Water insoluble organic compounds which liberate gaseous nitrogen at high temperatures and have at least one N—N single or double bond in each molecule are added to lubricants to improve lubricity and decrease corrosion while remaining readily removable from the surfaces to which they have been applied.

3,677,947
PERMANENT MAGNET
Alden E. Ray, Dayton, and Karl Strnat, Fairborn, Ohio, assignors to Th. Goldschmidt AG, Essen, Germany
No Drawing. Filed Aug. 31, 1970, Ser. No. 68,119
Claims priority, application Germany, Sept. 2, 1969, P 19 44 432.7
Int. Cl. C01f *1/06, 7/02*
U.S. Cl. 252—62.54 8 Claims
A permanent magnet comprising magnetically anisotropic particles which are preferably oriented and then

bonded. The powders are composed of at least two particle fractions of different average grain size, to wit

(a) a first fraction having an average grain size in the range of about 50–250 μm.,

(b) a second fraction having an average grain size in the range of about 5–50 μm., and

(c) said magnet also containing either a third fraction of such particles having an average grain size of about $<15\mu$m. or an inorganic or organic binder, the weight ratio of $a:b:c$ being about 7:3:1.

3,677,948

TRIARYL PHOSPHATE FUNCTIONAL FLUIDS

Silvio L. Giolito, Whitestone, N.Y., and Stanley B. Mirviss, Stamford, Conn., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Aug. 17, 1970, Ser. No. 64,655
Int. Cl. C09k *3/00*
U.S. Cl. 252—78 7 Claims

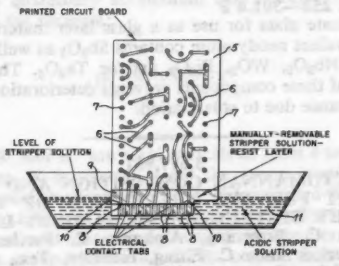
The present invention relates to a process and composition for transmission of pressure in a hydraulic system comprising a mixture of a styrenated triaryl phosphate and an alkylphenyl phenyl phosphate.

3,677,949

SELECTIVELY STRIPPING TIN AND/OR LEAD FROM COPPER SUBSTRATES

Frank A. Brindisi, Jr., Madison, Joseph S. Nagy, Watertown, and Eugene F. Yarkosky, Milford, Conn., assignors to Enthone, Incorporated, New Haven County, Conn.

Filed Sept. 4, 1970, Ser. No. 69,769
Int. Cl. C23g *1/06*; H05k *3/06*
U.S. Cl. 252—79.4 15 Claims



Acidic solutions for selectively stripping tin and/or lead from copper substrates or surfaces, comprising an aqueous solution of (1) at least one nitro-substituted aromatic compound; (2) an inorganic acid capable of readily reacting with tin and lead to form water-soluble salts thereof and incapable of reacting with tin and lead to form a water-insoluble compound film on the tin, lead or tin-lead alloy surface, preferably fluoboric acid; and (3) a thiourea.

3,677,950

CHEMICAL ETCHING SOLUTION FOR PRINTED WIRING BOARDS

Carmelo Leon Alderuccio, Tolland, Conn., assignor to Lee Alderuccio & Associates, Inc., Tolland, Conn.

No Drawing. Filed Apr. 30, 1969, Ser. No. 820,674
Int. Cl. C23g *1/14*; H05k *1/00*
U.S. Cl. 252—79.5 7 Claims

A chemical etching solution particularly adapted to selectively dissolve copper from laminated printed wiring boards in the presence of metals selected from the group consisting of tin, lead, nickel, gold and alloys thereof without causing attack of such metals consists of an aqueous ammoniacal solution of a normally acidic oxidizer, the solution having an alkaline pH up to about 11.

3,677,951

SELF-ANCHORABLE COMPOSITE ITEM AND METHOD OF MAKING SAME

Hirtus E. Alles, P.O. Box 71 (719 Williams St.), Williamston, Mich. 48895

Filed Feb. 27, 1970, Ser. No. 15,059
Int. Cl. C11d *17/04*
U.S. Cl. 252—92 9 Claims

An article of manufacture and method of making same comprising an integral combination of an article of use commonly referred to as a scrubbing material such as a bar of soap, a scouring pad, a brush, a sponge, et cetera, with a resilient sheet-form member substantially permanently affixed at one of its surfaces to the article of use, and having at its other surface a plurality of suction cups integrally molded therewith so as to be adapted to readily engage a smooth nonporous surface and to support the article of manufacture with respect to said surface.

3,677,952

METHOD OF BLEACHING SULFONATE SURFACTANTS

Lowell B. Lindy, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Oct. 2, 1970, Ser. No. 77,745
Int. Cl. C11d *7/54*
U.S. Cl. 252—94 7 Claims

Alkylaryl sulfonate surfactants are bleached by reacting their aqueous solutions with an inorganic hypohalite and an inorganic permanganate, sequentially or in combination. The process is particularly adaptable to decolorizing higher alkyl diphenyl ether disulfonates using sodium hypochlorite and potassium permanganate as the bleaching agents.

3,677,953

PERMANGANATE SILICATE CLEANER

Robert George Harris, Geigertown, Pa., assignor to Amchem Products, Inc., Township of Lower Gwynedd, Pa.

No Drawing. Filed Mar. 11, 1971, Ser. No. 123,444
Int. Cl. C11d *7/54*
U.S. Cl. 252—103 3 Claims

Compositions consisting of an alkali metal permanganate and alkali metal silicate which, when dissolved in aqueous solution, provide improved solutions for treating ferrous metal surfaces to remove scale deposits and other contaminants in the form of smut formed thereon; particularly for the removal of oxide incrustations and smut from ferrous metal surfaces which have been previously heat treated.

3,677,954

LIQUID ABRASIVE CLEANSER COMPOSITION

Meiken Nakajima, Ichikawa, and Yunosuke Nakagawa, Koshigaya, Japan, assignors to Kao Soap Co. Ltd., Tokyo, Japan

No Drawing. Filed July 24, 1970, Ser. No. 58,171
Claims priority, application Japan, July 28, 1969, 44/59,812; Dec. 27, 1969, 45/1,912
Int. Cl. C11d *3/14, 9/20, 13/00*
U.S. Cl. 252—121 4 Claims

A stable liquid scouring cleanser composition is comprised of 30–70% by weight of abrasive particles, from 15–60% by weight of water, from 1–10% by weight of a nonionic surfactant having an HLB lower than about 10 and from 1–10% by weight of an anionic surfactant. The composition may also contain from 0.1–10% by weight of a solubilizing agent to prevent separation of the constituents upon repeated freezing and thawings. The composition is prepared by homogeneously dispersing the constituents at a temperature of 50 to 100° C. with stirring.

3,677,955

TREATMENT OF DRY CLEANING BATHS

Harry M. Castrantas, Trenton, and Robert E. Keay, Hightstown, N.J., and Donald G. MacKellar, Yardley, Pa., assignors to FMC Corporation, New York, N.Y.

No Drawing. Filed July 23, 1970, Ser. No. 57,781
Int. Cl. C11d 7/50
U.S. Cl. 252—162 2 Claims

Hydrogen peroxide is used in the treatment of dirty dry cleaning baths based on aliphatic hydrocarbon or chlorinated solvents, to permit longer operation between distillations.

3,677,956

SYNERGISTIC METAL SEQUESTRANT

Ronald H. Carlson, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 680,011, Nov. 2, 1967. This application July 13, 1970, Ser. No. 54,661
Int. Cl. C02b 5/06; C11d 7/32, 7/36
U.S. Cl. 252—180 5 Claims

Mixtures of tris(hydroxymethyl)phosphine oxide, and iminodiacetic acid as well as the alkali metal salts thereof, exhibit marked synergism as sequestrant compositions over a broad pH range. The sequestrant compositions are useful as additives for detergents, metal cleaning baths, peroxide compositions and dyes. The chelate products are useful in the field of agriculture for the introduction of trace elements into plant life and especially in the treatment of iron chlorosis in plants.

3,677,957

CHEMILUMINESCENT REACTION OF CHLORINATED ETHYLENE CARBONATE WITH HYDROGEN PEROXIDE IN THE PRESENCE OF A FLUORESCER

Donald Roy Maulding, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Dec. 17, 1969, Ser. No. 886,042
Int. Cl. C09k 3/00
U.S. Cl. 252—188.3 6 Claims

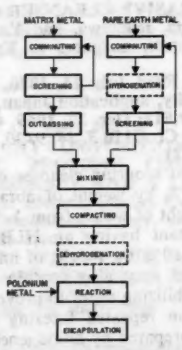
Disclosed is a chemiluminescent composition for reaction with a peroxide compound to produce chemiluminescent light, said composition containing a halogenated ethylene carbonate and an organic fluorescent compound in an organic solvent.

3,677,958

RADIOACTIVE HEAT SOURCE

Frank D. Lonadier, Miamisburg, and Carl J. Kershner, Centerville, Ohio, assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 6, 1968, Ser. No. 774,597
Int. Cl. C09k 3/02
U.S. Cl. 252—301.1 R 9 Claims



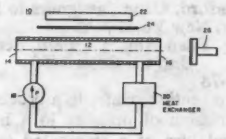
A radioactive heat source comprising a porous element formed by compacting intermixed ratios of matrix and rare earth type particles, and impregnating with polonium radioisotope, with pores or interstices of the element providing for escape of helium which may result from radioisotope decay.

3,677,959

LIQUID LASER CONTAINING CYCLOHEPTATRIENE

Charles Brecher, Little Neck, Romano Pappalardo, Westbury, and Harold Samelson, Sea Cliff, N.Y., assignors to GTE Laboratories Incorporated

Filed Oct. 29, 1970, Ser. No. 85,196
Int. Cl. F21k 2/02; H01s 3/00
U.S. Cl. 252—301.2 R 9 Claims



A dye laser utilizing an active material comprising the dye Rhodamine 6G in solution with the triplet state quencher cycloheptatriene. The resultant solution provides a dye laser having relatively long high energy output pulses.

3,677,960

GLASS LASER MATERIALS

Masahiko Ishiyama, Yokohama, Japan, assignor to Asahi Glass Co., Ltd., Tokyo, Japan

Filed June 29, 1970, Ser. No. 50,525
Claims priority, application Japan, July 3, 1969, 44/52,186
Int. Cl. C09k 1/04, 1/54; C03c 3/04
U.S. Cl. 252—301.4 F 6 Claims

A silicate glass for use as a glass laser material doped with trivalent neodymium contains Sb_2O_3 as well as TiO_2, MoO_3, Nb_2O_5, WO_3, Bi_2O_3 and/or Ta_2O_5. The combination of these components prevents deterioration in laser performance due to solarization.

3,677,961

GALACTOMANNAN COMPOSITION AND TREATMENT FOR THE PREVENTION OF THIXOTROPHY DESTRUCTION OF SAME BY LIGANDS

William C. Browning, Alphonse C. Perricone, and Katherine Anne C. Elting, Houston, Tex., assignors to Milchem Incorporated, Houston, Tex.

No Drawing. Filed Dec. 28, 1970, Ser. No. 102,270
Int. Cl. B01j 13/00
U.S. Cl. 252—316 23 Claims

The present invention relates to a method and composition for the prevention of the destruction of thixotropic structure in metal ion cross-linked galactomannan solutions when said solutions are exposed to an organic polyelectrolyte ligand as hereafter defined by introducing into the cross-linked galactomannan structure a bacterially modified carbohydrate in an amount sufficient to maintain the desired cross-linked structure in the presence of the ligand.

3,677,962

PROCESS FOR BREAKING PETROLEUM EMULSIONS

Gotz Koerner, Essen, and Gerd Rossmy, Essen-Werden, Germany, assignors to Th. Goldschmidt A.-G., Essen, Germany

No Drawing. Filed July 13, 1970, Ser. No. 54,592
Claims priority, application Germany, July 22, 1969, P 19 37 130.3
Int. Cl. B01d 17/04
U.S. Cl. 252—345 20 Claims

Process for breaking petroleum emulsions with polyoxyalkylene-polysiloxane-mixed blockcopolymers. The

polyoxylalkylene blocks of the polyoxyalkylene-polysiloxane-mixed blockcopolymers have a mole weight of between 500 to 4000 and consist of polyoxyethylene and polyoxypropylene units in a weight ratio of between about 40:60 to 100:0. The polysiloxane blocks contain 3 to 50 silicon atoms per block.

3,677,963
DEFOAMER COMPOSITION AND METHOD OF PREPARATION

Irwin A. Lichtman, Oradell, and Abraham M. Rosengart, Newark, N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Filed Sept. 30, 1970, Ser. No. 77,009
Int. Cl. B01d *17/00, 19/04;* C09k *3/00*
U.S. Cl. 252—358 10 Claims

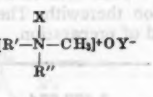
Defoamer compositions are prepared using substituted amides, oil soluble organic polymers, and hydrocarbon oil, by means of a novel quick-chilling process. Optionally, fats and silicone oil may be present. The compositions may be used for defoaming and/or preventing foam build-up.

3,677,964
SOLVENT COMPOSITION FOR LIQUID SCINTILLATION COUNTING

Richard V. Webb, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Dec. 31, 1970, Ser. No. 103,349
Int. Cl. B01f *1/00, 3/00*
U.S. Cl. 252—364 4 Claims

A solvent composition for dissolving samples for liquid scintillation counting consisting essentially of (a) a solvent suitable for use in liquid scintillation counting, (b) at least one quaternary ammonium base selected from the group of the formula:



wherein R′ and R″ are alkyl radicals of from 4 to 18 carbon atoms, X is selected from the group consisting of methyl and benzyl radicals, and Y is selected from the group consisting of hydrogen and lower alkyl radicals, the predominant class of quaternary ammonium consisting of the group wherein R′ and R″ contain from 4 to 14 carbon atoms, (c) methanol, and (d) an alcohol selected from the group consisting of t-pentyl alcohol and 2-methoxy ethanol. The quaternary ammonium base preferably is didodecyldimethylammonium hydroxide or methoxide, and is present in at least 0.25 molar concentration. The solvent advantageously is toluene, benzene, xylene, or dioxane, and is present in 60–70% by volume. The t-pentyl alcohol or 2-methoxy ethanol preferably are present in 4–10% by volume.

3,677,965
ALKYLHYDROXYPHENYL POLYAMIDES AS ANTIOXIDANTS

Martin Dexter, Briarcliff Manor, John Denon Spivack, Spring Valley, and David Herbert Steinberg, Bronx, N.Y., assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Original application Dec. 29, 1967, Ser. No. 694,370, now Patent No. 3,584,047. Divided and this application June 5, 1970, Ser. No. 57,397
Int. Cl. C07c *103/30;* B01j *1/16*
U.S. Cl. 252—403 9 Claims

Polyamides of alkylhydroxyphenylalkanoic acids and polyamines prepared by amidation procedures, are stabilizers of organic material otherwise subject to oxidative deterioration.

3,677,966
TEMPERATURE INDICATING DISPERSION FILTER

Jan Bol, Kelkheim, Taunus, Hildegard Buttner, Oberursel, Taunus, and Peter Kuhn, Ruppertshain, Taunus, Germany, assignors to The Battelle Development Corporation, Columbus, Ohio

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,150
Int. Cl. G01k *11/16, 11/18*
U.S. Cl. 252—408 1 Claim

A dispersion filter made primarily of glass with the addition of a solid plastic material having "an index of refraction (n_D) at 20° C. of about 1.560 to 1.568, a dispersion ($n_F - n_C$) of about 0.014 to 0.016 and a temperature coefficient (dn/dT) of the index of refraction of about 1×10^{-4} to 4×10^{-4} per degree C."

3,677,967
DOSE INDICATOR PAINT OF AN AQUEOUS EMULSION OF VINYL CHLORIDE COPOLYMER AND METHANYL YELLOW

Janos Dobo, Agnes Somogyi, and Endre Lakner, Budapest, Hungary, assignors to Medimpex Gyogyszerkulkereskedelmi Vallalat

No Drawing. Filed Jan. 15, 1969, Ser. No. 791,488
Claims priority, application Hungary, Jan. 18, 1968, MU-398
Int. Cl. G01n *23/06, 31/22*
U.S. Cl. 252—408 3 Claims

A dose indicator paint for controlling the irradiation of polyethylene and other non-hydrophilic target materials, comprising an aqueous emulsion of a vinyl chloride copolymer, 0.5 to 10% by weight of methanyl yellow and, if desired, additives.

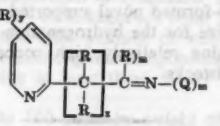
3,677,968
COORDINATION POLYMERIZATION CATALYST

John E. Bozik, Pittsburgh, Harold E. Swift, Gibsonia, and Ching-Yong Wu, Pittsburgh, Pa., assignors to Ameripol, Inc., Cleveland, Ohio

No Drawing. Original application Mar. 10, 1969, Ser. No. 812,536, now Patent No. 3,565,875, dated Feb. 23, 1971. Divided and this application July 9, 1970, Ser. No. 61,012
Int. Cl. C08d *3/06, 3/08*
U.S. Cl. 252—431 N 13 Claims

A coordination catalyst for polymerizing olefins, diolefins and alkylene oxides, consisting essentially of

(a) an iron complex comprising a ligand containing oxygen donor atoms and selected from the group consisting of iron acetylacetonate, iron octoate and iron naphthenate;
(b) a trialkyl aluminum compound; and
(c) a bidentate ligand capable of both pi and sigma bonding to form a five- or six-membered chelate ring, said ligand being characterized by the structural formula



wherein m is a number from 0 to 1, x is a number from 0 to 1, y is a number from 0 to about 4, R is a radical selected from the group consisting of hydrogen, alkyl, aryl, halogen, hydroxyl, and acetoxy, and Q is a radical selected from the group consisting of hydrogen, alkyl, halogen, hydroxyl and acetoxy, the major portion of said sigma bonding being attributable to the ring nitrogen, wherein the molar ratio of trialkyl aluminum compound to iron complex is from about 1/1 to 4/1 and the molar ratio of bidentate ligand to the iron complex is from about 0.1/1 to about 2.5/1.

3,677,969

HYDROGENATION OF ORGANIC COMPOUNDS

Joseph K. Mertzweiller and Horace M. Tenney, Baton Rouge, La., assignors to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 761,793, Sept. 23, 1968, which is a continuation-in-part of applications Ser. No. 674,097, Oct. 10, 1967, and Ser. No. 761,792, Sept. 23, 1968. This application Jan. 7, 1970, Ser. No. 1,281

Int. Cl. C07c *5/02*

U.S. Cl. 252—431 27 Claims

Novel sulfided hydrogenation catalysts are formed by impregnating a suitable support material with an aqueous solution of a salt of a transition metal; heat-treating the impregnated support at a temperature above 500° F. to form chemical complexes on the surface of the support and to drive off moisture and absorbed oxygen; contacting the supported metal complex with hydrogen sulfide; activating the surface complex by contacting the supported metal sulfide complex with a soluble organometallic compound wherein the metal constituent is selected from Groups I, II and III of the Periodic Chart of the Elements, and thereafter treating the activated support material in the presence of a gaseous stream containing hydrogen at a temperature of at least 300° F. to form a highly stable heterogeneous sulfided catalyst. The novel supported catalysts of the instant invention have been found to be highly active for the hydrogenation of organic feedstocks containing sulfur under extremely mild conditions.

3,677,970

HYDROGENATION OF ORGANIC COMPOUNDS

Joseph K. Mertzweiller and Horace M. Tenney, Baton Rouge, La., assignors to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 674,097, Oct. 10, 1967. This application Jan. 7, 1970, Ser. No. 1,282

Int. Cl. C07c *5/02*

U.S. Cl. 252—431 21 Claims

Novel hydrogenation catalyst are formed by impregnating a suitable support material with an aqueous solution of a salt of a transition metal; heat-treating the impregnated support at a temperature above 500° F. to form chemical complexes on the surface of the support and to drive off moisture and absorbed oxygen; activating the surface complex by contacting the impregnated support with a soluble organometallic compound wherein the metal constituent is selected from Groups I, II and III of the Periodic Chart of the Elements; treating the activated support material in the presence of hydrogen at a temperature of at least 300° F., and thereafter reacting the hydrogen treated activated support material with hydrogen sulfide. The so-formed novel supported sulfided catalysts are highly active for the hydrogenation of organic feedstocks containing relatively high concentration of sulfur in the feedstocks.

3,677,971

HYDROTREATING CATALYST

Robert J. White, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 9, 1970, Ser. No. 17,626

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 R 9 Claims

A catalyst comprising a layered synthetic crystalline aluminosilicate cracking component, preferably substantially free of any catalytic metal or metals, dispersed in a gel matrix comprising alumina, a Group VI hydrogenating component and a Group VIII hydrogenating component, and processes using said catalyst.

3,677,972

HYDROCRACKING CATALYST

Louis C. Gutberlet, Crown Point, and Ralph J. Bertolacini, Chesterton, Ind., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Apr. 7, 1969, Ser. No. 814,155

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 Z 11 Claims

Disclosed is a hydrocracking catalyst consisting essentially of an ultrastable, large pore, crystalline aluminosilicate material containing less than about 1% alkali metal and having deposited thereon a hydrogenation component selected from the metals, oxides, or sulfides of the Group VIII elements of the Periodic Table. The catalyst may additionally contain a metal, oxide or sulfide of a Group VI–B element.

3,677,973

TRANSALKYLATION OF ALKLAROMATIC HYDROCARBONS IN CONTACT WITH A ZEOLITE CATALYST COMPOSITION

Roy T. Mitsche, Island Lake, and Edward Michalko, Lombard, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Mar. 16, 1970, Ser. No. 20,024

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 Z 11 Claims

A catalyst composition which is particularly effective as a catalyst with respect to the transalkylation or disproportionation of toluene to form benzene and polymethylbenzene products. The catalyst comprises a zeolite with a mordenite crystal structure containing alumina fixed in combination therewith. The catalyst is characterized by a method of preparation.

3,677,974

MULTI-PURPOSE CONDUCTIVE ADHESIVE

Timothy J. Kilduff, Greenbelt, Md., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Continuation of abandoned application Ser. No. 739,632, June 25, 1968. This application Sept. 18, 1970, Ser. No. 73,666

Int. Cl. H01b *1/02*; B01f *17/42*

U.S. Cl. 252—514 6 Claims

A multi-purpose electrically conductive adhesive consisting of a novolak-epoxy resin, particulate silver and an imidazole cures at moderate temperatures to form an adhesive bond resistant to temperatures in the range 150–200° C.

3,677,975

PREPARATION OF SOLID SOLUTIONS OF METALLIC OXIDE MIXTURES BY FLAME-SPRAYING

John E. Bennett, Painesville, and Kevin J. O'Leary, Cleveland Heights, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Filed Oct. 26, 1970, Ser. No. 84,111

Int. Cl. H01b *1/06*; B05b *7/20*; C22b *11/00*

U.S. Cl. 252—518 8 Claims

A solid solution of a valve metal dioxide and a precious metal dioxide is prepared in bulk form independent of a substrate by passing, in finely-divided atomized form, an organic solution of a salt or ester of the valve metal and a salt of the precious metal through an oxidizing flame.

3,677,976

COMMERCIALLY USEFUL POLYPHENYLENE POLYMERS AND METHOD OF PRODUCTION THEREOF

Leroy J. Miller, Canoga Park, and Norman Bilow, Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

No Drawing. Continuation-in-part of application Ser. No. 349,770, Mar. 5, 1964. This application Apr. 9, 1970, Ser. No. 27,178

The portion of the term of the patent subsequent to Feb. 23, 1988, has been disclaimed

Int. Cl. C08g *33/00*

U.S. Cl. 260—2 H 11 Claims

Commercially useful, fusible and tractable polyphenylene polymers and method of preparing the same from monomers of biphenyl, terphenyls, quaterphenyls, and mixtures thereof, and mixtures of same with other aromatic material as aromatic monomers, oligomers and polymers with 5 or less aromatic rings, prepared with a Lewis acid catalvst and oxidant combination.

3,677,977

ORGANOSILICON COMPOUNDS CONTAINING SILAZANE AND SILOXANE LINKAGES

Richard Paul Bush, Penarth, and Bryan Thomas, Thomastown, Wales, assignors to Dow Corning Limited, London, England

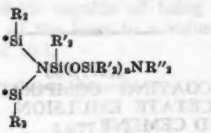
No Drawing. Filed Oct. 22, 1970, Ser. No. 83,180

Claims priority, application Great Britain, Oct. 31, 1969, 53,571/69

Int. Cl. C08g *33/10*

U.S. Cl. 260—47 R 10 Claims

Organosilicon compounds having both silazane (Si-N-Si) and siloxane (Si-O-Si) linkages are prepared by reacting (1) a hydroxyl containing organic or organosilicon material with (2) a cyclic silazane or cyclic siloxazane having from 6 to 12 members in the cyclic structure and 1, 2 or 3 groups of the general formula



where the free valence bond on each of the Si* atoms is attached to another member of the cyclic silazane or siloxazane structure, R is any monovalent hydrocarbon radical of less than 7 carbon atoms, R′ is a monovalent hydrocarbon or halogenohydrocarbon radical of 1 to 18 carbon atoms, R″ is H or an alkyl radical of 1 to 5 carbon atoms and *n* is 0 or 1.

3,677,978

METAL SALT COMPLEXES OF IMIDAZOLES AS CURING AGENTS FOR ONE-PART EPOXY RESINS

Rostyslaw Dowbenko, Wen-Hsuan Chang, and Carl C. Anderson, Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 702,531, Feb. 2, 1968. This application Aug. 23, 1971, Ser. No. 174,244

Int. Cl. C08g *23/14, 30/14*

U.S. Cl. 260—2 EP 12 Claims

Epoxy resins are blended with metal salt complexes of imidazoles to form compositions which remain in the uncured state for long periods of time at room temperature and cure conveniently at elevated temperatures. These epoxy resin compositions may be used as coatings, adhesives, potting compounds, castings and laminates.

3,677,979

SULFONATED PHENOL-ALDEHYDE RESINS

Raymond D. Beaulieu, North Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 769,368, Oct. 21, 1968, and a continuation-in-part of application Ser. No. 29,688, Apr. 17, 1970. This application Jan. 21, 1971, Ser. No. 108,594

Int. Cl. C08g *37/18*

U.S. Cl. 260—2.2 C 11 Claims

Thermosettable water-soluble phenolic two-component mixed resin compositions having sulfonic acid groups chemically combined therein to especially useful in the manufacture of porous ion-exchange media. These compositions are preferably prepared as aqueous solutions having a pH ranging from about 6.5 to 8.0. Methods for manufacture are described.

3,677,980

FOAMED POLYOLEFIN FILMS

Anthony Graham Marshall Last, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed May 14, 1970, Ser. No. 37,316

Claims priority, application Great Britain, May 21, 1969, 25,864/69

Int. Cl. C08f *47/10, 29/04, 45/04*

U.S. Cl. 260—2.5 HA 6 Claims

Foamed film containing a mixture of titanium dioxide and coarsely divided metallic aluminum.

3,677,981

SILICONE ELASTOMERIC COMPOSITIONS AND A METHOD FOR PREPARING SILICONE SPONGE RUBBERS THEREFROM

Tadashi Wada, Kunio Itoh, and Naoyoshi Kuga, Annaka, Japan, assignors to Shinetsu Chemical Company

No Drawing. Filed May 25, 1970, Ser. No. 40,428

Claims priority, application Japan, June 25, 1969, 44/50,184

Int. Cl. C08j *1/20*

U.S. Cl. 260—2.5 S 15 Claims

The silicone elastomeric compositions comprise:

(a) from 80 to 99 parts by weight of a diorganopolysiloxane gum having a viscosity of at least 1,000,000 cs. at 25° C., and containing from 0.025 to 0.25 mole percent of vinyl-group containing siloxane units in its molecule;

(b) from 1 to 20 parts by weight of a diorganopolysiloxane having a viscosity of at least 10 cs. at 25° C., and containing at least 10 times as many mole percent of vinyl-group containing siloxane units in its molecule as is contained in one molecule of component (a);

(c) an organohydrogen polysiloxane in an amount such that its Si—H linkages are from 50 to 200 mole percent of the total amount of vinyl groups contained in the above-given components (a) and (b), and containing at least three Si—H linkages in its molecule;

(d) from 20 to 100 parts by weight of a silica filler having a surface area of at least 150 $m.^2/g.$;

(e) from 1 to 10 parts by weight of a blowing agent; and

(f) a catalytic amount of a platinum compound.

When cured at elevated temperature, such elastomeric compositions give silicone sponge rubbers having high tensile strength and an internal structure of continuous foam. The cured products contain no residue of the curing agent. Thus they possess excellent compression set, resilient elasticity, resistance to heat, cold, and steam, electrical properties and flame retardant prop-

erty. They are therefore useful as insulating materials, soft packing materials, gasket cushion materials, toilet sponge puffs and sponge filters.

3,677,982
CELLULOSE SPONGE FOR REMOVING OIL SLICKS
John W. Marx, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Aug. 5, 1970, Ser. No. 61,501
Int. Cl. C08b *29/38, 29/10;* **C08f** *47/08*
U.S. Cl. 260—2.5 R **5 Claims**

Petroleum oil floating on the surface of water is removed therefrom by adsorbing the oil on a treated cellulose sponge and then burning the adsorbed oil from the sponge while it remains in contact with the water. During the combustion, the treated cellulose sponge continues to adsorb oil and deliver it to the combustion zone.

3,677,983
POLYURETHANE PRODUCTS
Thomas K. Brotherton and John W. Lynn, Charleston, and Robert J. Knopf, St. Albans, W. Va., assignors to Union Carbide Corporation
No Drawing. Division of application Ser. No. 478,400, Aug. 9, 1965, now Patent No. 3,553,249, which is a continuation-in-part of applications Ser. No. 256,495, Jan. 25, 1963, now Patent No. 3,275,679, and Ser. No. 265,367, Mar. 15, 1963. This application Aug. 7, 1969, Ser. No. 849,299
Int. Cl. C08g *22/24, 22/26, 22/44*
U.S. Cl. 260—2.5 AT **1 Claim**

Polyurethane products are obtained by reacting organic polyisocyanates which are characterized by a common structural unit, with active hydrogen containing compounds as determined according to the Zerewitinoff method. These products have a high degree of utility in fields such as cast and thermoplastic polyurethanes, reinforced plastics, elastic fibers and films, coatings, urethane foams especially rigid urethane foam products, etc.

3,677,984
ELECTRODEPOSITION COATINGS FROM AMINE SALTS OF VINYL MODIFIED FATTY ACIDS
Herbert Aschkenasy and John Joseph Schuler, Jr., Louisville, and Jerry Efton Bower, Jeffersontown, Ky., assignors to Celanese Coatings Company, New York, N.Y.
No Drawing. Filed Apr. 17, 1969, Ser. No. 817,139
Int. Cl. C08f *3/44, 15/26;* **C09d** *5/02*
U.S. Cl. 260—21 **10 Claims**

The amine salt of an interpolymer of (a) an unsaturated fatty acid, (b) acrylic or methacrylic acid, (c) a vinyl aromatic monomer and (d) a monomer differing from (a), (b), and (c) is solubilized in an aqueous solution and applied to an electrically conductive substrate by electrodeposition.

3,677,985
PRESSURE SENSITIVE ADHESIVE COMPOSITIONS
Julius Sirota, South Plainfield, David J. Bentley, Jr., Westfield, and Benjamin D. Jubilee, Jr., Millington, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.
No Drawing. Filed Oct. 6, 1970, Ser. No. 78,558
Int. Cl. C08d *9/12*
U.S. Cl. 260—27 R **5 Claims**

Pressure sensitive adhesives characterized by their excellent properties of tack, peel adhesion, and cohesive strength, and the substrates coated therewith are described.

3,677,986
PRODUCTION OF PARA-SUBSTITUTED PHENOL/FORMALDEHYDE RESINS
Alan D. Buchanan, Rosanna, Victoria, Australia, assignor to Monsanto Australia Limited, Melbourne, Victoria, Australia
No Drawing. Filed Feb. 26, 1970, Ser. No. 14,664
Claims priority, application Australia, Feb. 27, 1969, 51,144/69
Int. Cl. C08g *51/24*
U.S. Cl. 260—29.3 **4 Claims**

Process for the production of alkyl or aryl p-substituted phenol/formaldehyde resins in which a phenolic component such as an alkyl p-substituted phenol or an aryl p-substituted phenol is first reacted with formaldehyde in the presence of an inorganic alkaline catalyst in a heterogeneous multi-phase reaction medium after which the reaction product is etherified to produce the desired resin product.

3,677,987
ORGANO POLYMER CEMENTS WITH EXTENDED WORKING TIME
Samuel A. Pence, Jr., Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Jan. 26, 1970, Ser. No. 5,919
Int. Cl. C08f *29/00*
U.S. Cl. 260—29.6 M **6 Claims**

A small amount of cupric ions has been discovered to produce an induction period in the setting of an organogel cement modified with a soluble chromium compound, thereby giving the precursor liquid slurries of such cements more working time. These cements are prepared by slurrying a solid, water-soluble, organo-polymer in an organo-solvent for the polymer and incorporating small amounts of a hexavalent chromium compound and cupric ions. The slurry sets into a gel, which is generally stronger with increases in polymer concentration. The set-time, i.e., period during which the formulation can be readily worked as by pumping, may be extended several fold in the practice of the instant invention.

3,677,988
TEXTURE COATING COMPOSITION OF POLYVINYL ACETATE EMULSION, ASBESTOS AND PORTLAND CEMENT
Albert L. Kimmel, Kansas City, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.
No Drawing. Filed Feb. 20, 1970, Ser. No. 13,209
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.6 S **8 Claims**

A new textured coating having a random stucco-like appearance formed from asbestos and portland cement dispersed in a polyvinyl acetate or ethylene modified polyvinyl acetate emulsion. The above coating composition can also contain other mineral fillers, such as perlite, sand and vermiculite.

3,677,989
ETHYLENE/ACRYLIC ACID COPOLYMER EMULSIONS
Richard D. Jenkinson, St. Albans, W. Va., assignor to Union Carbide Corporation
No Drawing. Continuation of application Ser. No. 676,730, Oct. 20, 1967, which is a continuation of application Ser. No. 331,922, Dec. 19, 1963. This application June 16, 1970, Ser. No. 48,906
Int. Cl. C08f *3/42*
U.S. Cl. 260—29.6 H **2 Claims**

The present invention relates to the process for producing an aqueous ethylene/acrylic acid emulsion comprising mixing a random interpolymer of ethylene and acrylic acid, said interpolymer containing from 2 to 30 weight percent polymerized acrylic acid and having a

melt index of from 1 to 1000 decigrams per minute with an emulsifying amount of an alkali metal hydroxide and from 5 to 25 weight percent, based on the weight of said copolymer, of water, heating said mixture with agitation to a temperature of about 150 to 200° C. and adding sufficient water to provide an emulsion containing no greater than about 50 weight percent of said copolymer.

Emulsions containing the aforementioned ethylene copolymers are also disclosed.

3,677,990

STABLE AQUEOUS EMULSIONS CONTAINING A TERPOLYMER OF VINYL ALCOHOL, A VINYL ESTER AND AN N-VINYLLACTAM

Eugene S. Barabas, Watchung, Frederick Grosser, Midland Park, and Louis Schneider, Elizabeth, N.J., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed Aug. 12, 1970, Ser. No. 63,306

Int. Cl. C08f *1/13, 19/00, 45/34*

U.S. Cl. 260—29.6 WB **5 Claims**

A stable emulsion is disclosed of a graft terpolymer of an N-vinyllactam, vinyl alcohol and a vinyl ester with water as the external phase. Among the vinyllactams is N-vinyl pyrrolidone. Vinyl esters include vinyl acetate. The vinyllactam and vinyl alcohol copolymer forms the main chain of the terpolymer.

3,677,991

ANIONIC ACRYLATE LATEXES THAT POSSESS SENSITIVITY TO ALKALINITY

Carl Moore, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 14, 1968, Ser. No. 752,723

Int. Cl. C08f *1/92*

U.S. Cl. 260—29.6 H **12 Claims**

Anionic latexes of copolymers comprising a lower alkyl acrylate such as butyl acrylate and an α,β-ethylenically unsaturated carboxylic monomer such as methacrylic acid and maleic anhydride capable of being coagulated by adjusting the pH of the latex to a value ranging from about 8.8 to about 10.1.

3,677,992

POLYAMIDE-IMIDE COMPOSITIONS CONTAINING COATABILITY AIDS

Edwin F. Morello, Whiting, Ind., assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Apr. 7, 1971, Ser. No. 132,164

Int. Cl. C08g *51/34*

U.S. Cl. 260—32.8 N **6 Claims**

The coatability of an amide-imide polymeric coating on a magnet wire is substantially improved by the addition of aromatic ketones having a boiling range of about 200° C. to 310° C. or monohydric alcohols boiling in the range of about 75° C. to 150° C. or utilizing a mixture of both.

3,677,993

COMPOSITIONS FOR GASKETS HAVING IMPROVED RESISTANCE TO WATER-BASED AEROSOL PRODUCTS

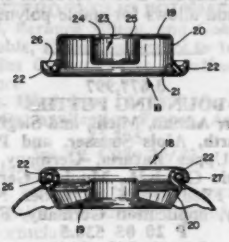
Robert P. Edmonston, Billerica, Joel A. Gribens, Framingham, and Charles W. Simons, Bedford, Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Mar. 10, 1970, Ser. No. 18,262

Int. Cl. C08c *11/56, 11/50;* **C08d** *9/00*

U.S. Cl. 260—33.6 A **1 Claim**

Compositions for use as sealing gaskets in aerosol mounting cups, which contain a peptized polychloroprene rubber dissolved in a volatile organic solvent and a ternary curing system consisting of di-o-tolylguanidine, 2-mercaptoimidazoline and dipentamethylenethiuram hexasulfide. Additional ingredients such as fillers, plasticizers, antioxidants and pigments may be incorporated to modify



certain properties of the compositions and of the gaskets made from them.

3,677,994

CEMENT-FILLED POLY(ARYLENE SULFIDE) RESINS

Harold V. Wood and Terry D. Brown, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Apr. 28, 1970, Ser. No. 32,737

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 R **4 Claims**

Moldable compositions which are suitable for forming into various finished products are prepared by adding up to 50 weight percent based on the total weight of the composition of a hydraulic cement to a poly(arylene sulfide) resin. In a preferred method of preparing the moldable compositions a slurry of a poly(arylene sulfide) resin and a hydraulic cement are formed, the liquid is allowed to evaporate, and the resulting granular mixture is heated, cured and then subjected to molding, yielding molded articles having good values in modulus, tensile and impact.

3,677,995

EPOXY RESIN CEMENT

Mason H. Earing, Danville, Ill., assignor to General Electric Company

Continuation-in-part of application Ser. No. 29,765, Apr. 27, 1970, which is a continuation of application Ser. No. 699,252, Sept. 20, 1967. This application July 7, 1970, Ser. No. 52,953

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 EP **20 Claims**

A thermosetting epoxy compound is provided comprising a first mix of glycidyl ether of polyhydric phenols and a cycloaliphatic polyepoxy resin in the ratio of about 1:4 to 3:2 and a suitable thixotropic agent. A suitable filler to improve the physical properties of the compound may be incorporated into the first mix. To this is admixed a second mix comprising a curing agent of a boron trifluoride amine complex dissolved in a polyfunctional hydroxylic solvent in sufficient quantity so that the gelation time is substantially independent of the quantity of curing agent. The resulting admixed compound is thixotropic and exhibits a relatively rapid gelation time which occurs at room temperature.

3,677,996

ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER CONTAINING POLYGLYCOL DERIVATIVE

Wolfgang Kaiser, Adrian, Mich., and Siegfried Nitzsche, Ernst Wohlfarth, and Paul Hittmair, Burghausen, Upper Bavaria, Germany, assignor to Wacker-Chemie G.m.b.H., Munich, Bavaria, Germany

No Drawing. Filed Mar. 3, 1971, Ser. No. 120,679

Int. Cl. C08g *31/02*

U.S. Cl. 260—46.5 G **3 Claims**

This invention relates to room-temperature vulcanizing siloxane elastomers characterized in that, besides a known

crosslinking agent which contains a nitrogen atom and three hydrolyzable groups, the siloxane is mixed with a polyglycol which imparts a low modulus elasticity to the cured polymer and allows for stable polymers in the uncured state.

3,677,997
BOUNCING PUTTIES

Wolfgang Kaiser, Adrian, Mich., and Siegfried Nitzsche, Ernst Wohlfarth, Alois Strasser, and Paul Hittmair, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

No Drawing. Filed Feb. 5, 1971, Ser. No. 113,104
Claims priority, application Germany, Feb. 6, 1970, P 20 05 530.5
Int. Cl. C08g *51/34*
U.S. Cl. 260—332 SB **5 Claims**

Bouncing putty based on organosiloxane-boron compound mixtures and reaction products are improved by the addition of polyglycols. The improved bouncing putty does not become tacky upon extended kneading or use.

3,677,998
PRIMER FOR ADHESION OF SILICONE RUBBER TO METAL

Donald G. Young, Glendale, Ky., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Apr. 9, 1970, Ser. No. 27,112
Int. Cl. C08g *51/28*
U.S. Cl. 260—33.6 SB **4 Claims**

A mixture of an organotitanate, tetra(methoxyethoxy) silane, a methylsiloxane resin, acetic acid or an organotriacetoxysilane and a hydrocarbon solvent is useful as a primer in adhering a silicone rubber to a metal surface such as titanium.

3,677,999
FLAME-RESISTANT CAST RESIN MOLDING MATERIALS, PARTICULARLY FOR THE PRODUCTION OF NONCOMBUSTIBLE ELECTRICAL COMPONENTS

Hans Denk and Reiner Habrich, Munich, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Berlin and Munich, Germany

No Drawing. Filed Nov. 3, 1970, Ser. No. 86,589
Claims priority, application Germany, Nov. 5, 1969, P 19 55 524.9
Int. Cl. C08g *51/04*
U.S. Cl. 260—38 **4 Claims**

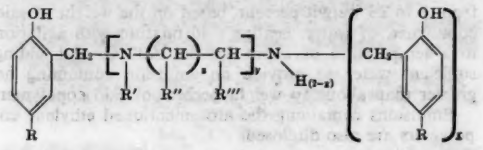
Flame resistant cast resin molding materials, particularly for manufacture of noncombustible electrical components based on aluminum oxide containing epoxy, polyester, phenol, polyurethane or silicone resin masses. The cast resin molding material contains, for 100 parts by weight of unfilled cast resin mass, 80 to 160 parts by weight of a mixture of $Al_2O_3 \cdot 3H_2O$ and a fine structured fossil. The amount of the fossil is between 6 and 12% by weight of the total amount of filler.

3,678,000
POLYPROPYLENE STABILIZED WITH METAL SALTS OF N - HYDROXYALKYLBENZYL ALKYLENEPOLYAMINES

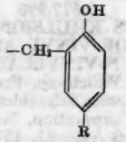
John Howard Adams, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Application Dec. 6, 1968, Ser. No. 781,996, which is a continuation-in-part of application Ser. No. 714,773, Mar. 21, 1968. Divided and this application Sept. 25, 1970, Ser. No. 75,686
Int. Cl. C08f *45/62*
U.S. Cl. 260—45.75 N **5 Claims**

Polypropylene compositions stabilized against photodegradation by divalent metal salts of polyamines having the formula:



wherein R is an alkyl group of about 5 to about 15 carbon atoms; R' is H or



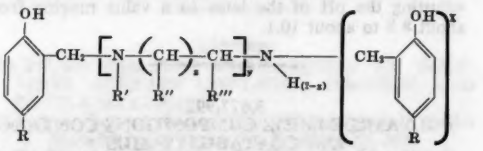
R'' and R''' which may be alike or different are H or alkyl groups having less than 5 carbon atoms each; z is an integer in the range of 1 to 12; y is an integer in the range of 1 to 4; x is 0, 1 or 2 and the number of mols of divalent metal per mol of salt is in the range of about 0.5 to 3.5, inclusive.

3,678,001
POLYPROPYLENE STABILIZED BY NICKEL SALTS OF N-(HYDROXYALKYLBENZYL) ALKYLENEPOLYAMINES

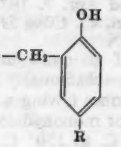
John Howard Adams, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 781,996, Dec. 6, 1968, which is a continuation-in-part of abandoned application Ser. No. 714,773, Mar. 21, 1968. This application Dec. 28, 1970, Ser. No. 102,163
Int. Cl. C08f *45/62*
U.S. Cl. 260—45.75 N **5 Claims**

Substantially crystalline polypropylene stabilized by nickel salts of alkylenepolyamines of the formula:



wherein R is an alkyl group of about 5 to about 15 carbon atoms; R' is H or



R'' and R''' which may be alike or different are H or alkyl groups having less than 5 carbon atoms; each z is an integer in the range of 1 to 12; y is an integer in the range 1 to 4; and x is 0, 1 or 2.

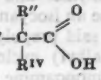
3,678,002
AMBIENT TEMPERATURE CURABLE SILICONE RUBBER COMPOSITIONS

Siegfried Nitzsche and Ernst Wohlfarth, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

No Drawing. Filed Oct. 19, 1970, Ser. No. 82,199
Int. Cl. C08f *21/01*
U.S. Cl. 260—18 S **9 Claims**

Room temperature curable silicone rubber stocks exhibiting improved reversion resistance after curing are

prepared from mixtures of hydroxyl endblocked diorganopolysiloxanes, polyfunctional organosilicon compounds having at least three hydrocarbonoxy groups per molecule and metal salts of carboxylic acids wherein the salts are prepared from monocarboxylic acids containing 8 to 28 carbon atoms per molecule wherein the carboxyl group is bonded directly to a tertiary or quaternary carbon atom. The metal salts employed as catalysts are thus salts of acids of the general formula



where R'' and R''' are alkyl, aryl, alkenyl or aralkyl groups and R^{IV} is hydrogen or an alkyl, aryl, alkenyl or aralkyl group, not more than 50% of the R^3 groups being hydrogen.

3,678,003

ROOM TEMPERATURE VULCANIZABLE SILICONE ELASTOMER STOCKS

Wolfgang Kaiser, Adrian, Mich., and Siegfried Nitzsche, Ernst Wohlfarth, and Paul Hittmair, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

No Drawing. Filed Dec. 17, 1970, Ser. No. 99,256
Claims priority, application Germany, Dec. 23, 1969, P 19 64 502.4
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 G **11 Claims**

A room temperature vulcanizable silicone rubber stock is prepared by admixing and storing in the substantial absence of moisture (1) an essentially linear oganosiloxane polymer having chemically reactive end groups with (2) a crosslinking organosilicon compound containing at least three hydrolyzable groups per molecule, at least some of the hydrolyzable groups being amino groups bonded to silicon through Si—N linkage and any remaining hydrolyzable groups are oxime groups, and (3) a silane containing at least one amino substituent bonded to silicon over one or more carbon atoms and at least one monovalent hydrocarbonoxy radical or substituted hydrocarbonoxy radical bonded to silicon over an Si—O—C linkage, any substituents in said radical being amino or alkoxy groups. Fillers and curing catalysts are optionally present. The products exhibit greatly improved adhesion to a wide variety of substrates when compared to previously known RTV silicone rubber stocks.

3,678,004

ACID-STABILIZED EPOXIDE RESIN COATING COMPOSITIONS AND METHOD OF PREPARING SAME

Raymond E. Meyers, Westchester, Ill., and Edgar W. Eubanks, Westview Village, Ohio, assignors to SCM Corporation, Cleveland, Ohio

No Drawing. Filed Jan. 7, 1970, Ser. No. 1,325
Int. Cl. C08g *30/10*
U.S. Cl. 260—47 EC **10 Claims**

Disclosed are acid-stabilized epoxide resin coating compositions and processes for curing same. The compositions are one-component mixtures containing an epoxide resin, chelates of aluminum alcoholates as the curing or crosslinking agent and sufficient acid (e.g., at least about 0.1% by weight of the overall coating composition) to maintain low viscosity in the coating composition upon storage.

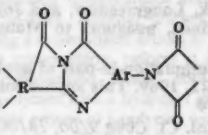
3,678,005

MIXED IMIDE-ISOINDOLOQUINAZOLINEDIONES HETEROCYCLIC POLYMERS

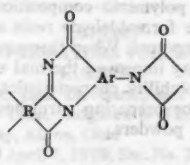
Guy Rabilloud, Bernard Sillion, and Gabriel de Gaudemaris, Grenoble, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, France

No Drawing. Filed Apr. 14, 1970, Ser. No. 28,526
Claims priority, application France, Apr. 18, 1969, 12,375
Int. Cl. C08g *20/32*
U.S. Cl. 260—47 CP **18 Claims**

Heat-resistant, as well as tough polymers are provided consisting essentially of recurring units of at least one of the following formulae:



and



wherein Ar is selected from homocyclic and heterocyclic trivalent aromatic radicals, the three valences of which are linked to different carbon atoms, two of said valencies being linked to adjacent carbon atoms, and R is a tetravalent organic radical containing at least two carbon atoms. Precursors and processes to porduce these polymers are also described.

3,678,006

CURABLE POLYPHENYLENE COPOLYMERS AND RESIN COMPOSITIONS

Norman Bilow, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

No Drawing. Continuation-in-part of application Ser. No. 782,002, Dec. 6, 1968. This application Jan. 7, 1971, Ser. No. 104,777
Int. Cl. C08g *33/00, 33/10*
U.S. Cl. 260—47 R **9 Claims**

An improved new class of polyphenylene copolymers, terpolymers and quaterpolymers modified with an alkyl and/or aryl phenolic compound and/or aromatic amine curable to useful coating, bonding and molded resins with curing agents generally applicable to phenolic resins.

3,678,007

METAL SALT COMPLEXES OF IMIDAZOLIUM SALTS AS CURING AGENTS FOR ONE PART EPOXY RESINS

Rostyslaw Dowbenko and Carl C. Anderson, Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 887,784, Dec. 23, 1969. This application Aug. 23, 1971, Ser. No. 174,218
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 EN **10 Claims**

Storage-stable, curable epoxy resin compositions comprise a mixture of an epoxy resin and a metal salt complex of an imidazolium salt. Preferably, the composition

includes a nitrogenous compound, such as urea, dicyandiamide, melamines or thioureas. These compositions are storage-stable in the uncured state for long periods of time at room temperature, but can be easily cured at elevated temperatures to provide products having excellent sheer strength, peel strength and other properties. These epoxy resin composions can be used as coatings, adhesives, potting compounds, in casting and laminates, and for similar purposes.

3,678,008

THERMOSETTABLE AROMATIC AMINE FORMALDEHYDE RESIN COMPOSITIONS MODIFIED WITH AN AROMATIC POLYCARBOXYLIC COMPOUND

Rodney M. Huck, Longmeadow, and John R. Le Blanc, Wilbraham, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 792,790, Jan. 21, 1969. This application Sept. 23, 1970, Ser. No. 74,874

Int. Cl. C08g *9/06, 15/00*

U.S. Cl. 260—65 **7 Claims**

Thermosettable polymeric compositions incorporating an aromatic amine formaldehyde resin and an aromatic polycarboxylic compound. When thermoset by heat, these compositions display improved thermal stability. Because of their solvent solubility characteristics, these compositions are useful for preparing varnishes. They are also useful in molding powders.

3,678,009

THERMOCURABLE CRYSTALLINE POLYURETHANES BASED ON BRANCHED POLYESTERS

Friedrich Lohse, Allschwil, Rolf Schmid, Reinach, Baselland, Willy Fisch, Binningen, and Hans Batzer, Arlesheim, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Filed Dec. 9, 1969, Ser. No. 883,628

Claims priority, application Switzerland, Dec. 16, 1968, 18,755/68

Int. Cl. C08g *22/12, 22/18*

U.S. Cl. 260—75 NP **16 Claims**

Thermocurable composition which comprises (a) slightly branched polyesters possessing terminal hydroxyl groups having an average molecular weight of about 1200 to about 10,000, and (b) a diisocyanate with 0.9 to 1.1 equivalents of isocyanate groups being employed in each case per 1 equivalent of hydroxyl group. The compositions are useful as dipping resins, casting resins, laminating resins, impregnating resins, coating agents, sealing compositions, potting and insulating compositions for the electrical industry, or as adhesives.

3,678,010

VULCANIZED SILICON TERMINATED POLYMERS

George L. Brode, Bridgewater, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Dec. 22, 1969, Ser. No. 887,337

Int. Cl. C08g *17/14, 47/06*

U.S. Cl. 260—75 T **8 Claims**

A silicon terminated organic polymer comprising a carbonyl chloride terminated polyester prepolymer wherein the carbonyl chloride terminal groups have been reacted with an organosilicon compound to terminate, that is cap or endblock said polymers with organosilicon groups.

3,678,011

NOVEL POLYURETHANE-UREA COATING COMPOSITION AND CAST FILM

John Bernhard Hino, Cheektowaga, and Bernard Taub, Williamsville, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Jan. 13, 1970, Ser. No. 2,652

Int. Cl. C08g *17/00, 22/00;* B32b *27/40*

U.S. Cl. 260—75 NH **14 Claims**

Production of a novel polyurethane-urea composition of low substantially constant viscosity by (1) reacting a hydroxy-terminated polymer and an excess of aromatic diisocyanate to produce an isocyanate-terminated prepolymer and (2) reacting said prepolymer with a 5-amino-1-methyl-3,3-bis(lower alkyl) cyclohexane methyl amine, and bis(lower alkyl) monoamine in a polar organic solvent. This composition applied as a coating provides a thermoplastic film of excellent mechanical properties on evaporation of the solvent.

3,678,012

METHOD OF PRODUCING PHOSPHORUS-CONTAINING CURABLE MATERIAL

Hideaki Matsuda, Marugame, Hisakazu Mori, Kagawaken, and Fujio Yamauchi, Kanongi, Japan, assignors to Okura Kogyo Kabushiki Kaisha, Takamatsu-shi, Kagawa-ken, Japan

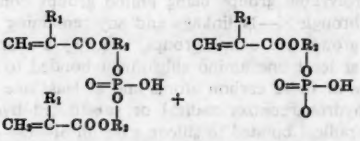
No Drawing. Filed Oct. 15, 1970, Ser. No. 81,188

Claims priority, application Japan, Dec. 23, 1969, 44/104,001

Int. Cl. C08g *22/16*

U.S. Cl. 260—77.5 AR **14 Claims**

Phosphorus-containing curable products useful for the production of flame-resistant materials are provided herein, said products prepared by the addition reaction of an oxirane compound with polymerizable mixed phosphates represented by the following general formula:



wherein R_1 represents a hydrogen or a methyl group, and R_2 represents a lower alkylene group or a halogenated lower alkylene group, mixing the produced reaction products with polymerizable monomers to dissolve thereof, optionally adding polyhydric alcohols thereto, and reacting thereof with a polyisocyanate.

3,678,013

PROCESS OF REACTING CARBOXY-TERMINATED POLYALKYLENE POLYMER WITH AN IMINE AND RESULTANT PRODUCT

Leon Sherwood Minckler, Jr., Watchung, N.J., assignor to Esso Research and Engineering Company

No Drawing. Filed Apr. 7, 1970, Ser. No. 26,421

Int. Cl. C08d *3/04, 5/02*

U.S. Cl. 260—77.5 R **20 Claims**

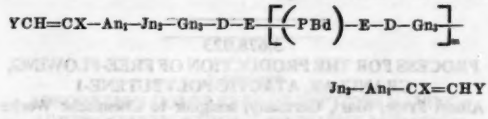
This invention is directed to polymers formed by the reaction of aziridines with carboxy-terminated polyalkylene polymers to produce reactive polymers having substantially the same molecular weight as the charge polymer.

3,678,014
LOW TEMPERATURE PEROXIDE CURABLE THERMOSETTING POLYURETHANE RESIN HAVING TERMINAL UNSATURATION

Hisao Suzuki, Fujisawa-shi; Akira Musashi, Kanagawa-ken; Makoto Hiruta, Kanagawa-ken, and Hiroo Muramoto, Kanagawa-ken, all of Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

Filed Aug. 7, 1969, Ser. No. 849,298
Int. Cl. C08g 22/00
U.S. Cl. 260—77.5 CR 20 Claims

A thermosetting resin having the formula:



wherein X is hydrogen, or an alkyl radical containing up to four carbon atoms; Y is selected from the group consisting of hydrogen, phenyl, and alkoxycarbonyl; A is a carboxyl, or a carbonyl group; J is an alkylene group containing less than five carbon atoms and G is selected from the group consisting of urethane, carboimino and ureylene group; E is urethane or carboimino, and can be the same or different from G; D is selected from the group consisting of alkylene, cycloalkylene, phenylene, naphthylene, pyrene, bis(phenylene)-methylene and a tris(phenylene)methylidyne radical (in which the radical may be substituted by a lower alkyl radical); PBd is a polybutadiene or copolybutadiene chain having a polymerization degree of from 4 to 370 and from about 50 percent to about 100 percent of 1,2-configuration; n_1, n_2, and n_3 express 0 or 1 respectively, wherein a combination of (1) n_1=1, n_2=1, and n_3=0, and (2) n_1=1, n_2=0 and n_3=0 does not occur; and m expresses an integer of 1 to 3.

3,678,015
PROCESS FOR MAKING POLYIMIDE PREPOLYMER WITH MIXTURE OF PHENOLIC AND HYDROCARBON SOLVENTS

Fred F. Holub, and John T. Hoback, both of Schenectady, N.Y., assignors to General Electric Company

Filed April 6, 1970, Ser. No. 26,079
Int. Cl. C08g 20/32
U.S. Cl. 260—78 UA 6 Claims

A method is provided for making a curable polymeric reaction product of an organic diamine and an aliphatically unsaturated dicarbonyl compound such as an organic anhydride or organic dicarboxylic acid. The curable polymeric reaction product can be heat softened to allow incorporation of filler and is convertible to the infusible state by heat or by the employment of a free radical initiator. Reaction of the organic diamine and the aliphatically unsaturated dicarbonyl compound is effected in a phenolic-liquid hydrocarbon solvent medium. The hydrocarbon can serve as an azeotroping agent to effect removal of water of reaction prior to the recovery of the reaction product of the organic diamine and the aliphatically unsaturated dicarbonyl compound. The polymeric reaction product can be molded to produce high temperature resistant polyimide films and structures.

3,678,016
FABRICATION OF SHAPED ARTICLES CROSS-LINKED BY CHEMICAL ADDITION REACTIONS

Robert L. Zimmerman; Kent S. Dennis, and Eugene R. Moore, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 342,812, Feb. 5, 1964, abandoned. This application Feb. 27, 1967, Ser. No. 618,998
Int. Cl. C08f 27/00
U.S. Cl. 260—78.4 D 10 Claims

"Cross-linking of a reactive polymer and a curing agent which occurs by a chemical addition reaction has been found to be reversible at elevated temperatures. The reversible nature of the cross-linking reaction makes it possible to prepare more uniformly crosslinked articles by separately heating a polymer such as styrene-maleic anhydride and a polyol, combining them at elevated temperatures and then by cooling form uniform cross-links. Another feature of the invention provides for heating a cross-linked article to reverse the cross-links, fluidize the composition, reform it and then cool to recross-link the composition. Useful coreactive functional groups include a polymer with a hydroxyl group and a curing agent with anhydride groups or a polymer with carboxylic acid groups and a curing agent with vinyl ether groups.

3,678,017
INHIBITING PREMATURE VULCANIZATION OF RUBBERS

James R. Shelton, East Cleveland, and Roger J. Hopper, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed April 7, 1970, Ser. No. 26,431
Int. Cl. C08f 27/06; C08c 11/60, 11/54
U.S. Cl. 260—79.5 B 16 Claims

Retarders of premature vulcanization of rubber, said retarders including N-alkylthio or N-arylthio sulfonamides and N-alkylthio or N-arylthio sulfamides, e.g., N-(n-butyl thio)-N-methyl-methanesulfonamide.

3,678,018
SULFUR-CURABLE OLEFINIC COPOLYMERS AND METHOD FOR PRODUCING THE SAME

Seimei Yasui, Takatsuki-shi; Masaaki Hirooka, Ibaragi-shi, and Teruo Oshima, Nishinomiya-shi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Feb. 10, 1969, Ser. No. 798,121
Claims priority, application Japan, Feb. 20, 1968, 43/10961
Int. Cl. C08f 15/40
U.S. Cl. 260—80.78 13 Claims

A sulfur-curable olefinic copolymer consisting essentially of

1. at least one 2-norbornene compound having at the fifth position of the norbornene nucleus a hydrocarbon group containing at least 3 to 200 acyclic and non-conjugated carbon-carbon double bonds, and
2. at least one member selected from the group consisting of ethylene and α-olefin having three to 20 carbon atoms.

This sulfur-curable olefinic copolymer has excellent co-curability with a diene rubber and produced by contacting said 2-norbornene component and ethylene and/or said αolefin with a catalyst consisting essentially of an organoaluminum compound and a member selected from the group consisting of a vanadium compound having at least trivalencies and a titanium compound having at least trivalencies.

3,678,019
NOVEL PROCESS FOR OLEFIN POLYMERIZATION

Joseph Wagensommer, Westfield, N.J., assignor to Esso Research and Engineering Company

Filed March 16, 1970, Ser. No. 20,121
Int. Cl. C08f 15/40
U.S. Cl. 260—80.78 9 Claims

This invention is directed to a novel process for preparing copolymers of ethylene and certain alpha olefins (including

terpolymers with dienes) by reaction in the presence of vanadium and titanium catalysts together with aluminum cocatalysts.

3,678,020

STRIPPABLE UNSATURATED INTERPOLYMER COMPOSITIONS

Karl F. Schimmel, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 23, 1969, Ser. No. 827,177
Int. Cl. C08f *15/40, 19/00, 29/08*
U.S. Cl. 260—80.78 12 Claims

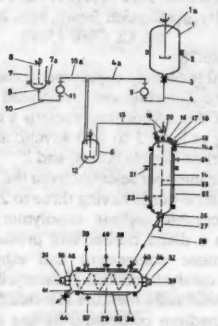
This invention relates to a method of forming strippable films of certain unsaturated hydrocarbon polymers which are non-rubbery interpolymers of a cyclic polyene and at least one monoolefin, said interpolymer having an essentially saturated carbon chain containing a substantial proportion of the total carbon atoms in the polymer molecule and containing sufficient ethylenically unsaturated groups in the polymer molecule to permit substantial curing of films thereof by an oxidative mechanism, said interpolymers having an intrinsic viscosity of 0.6 or less. The strippable films are prepared by incorporating into the interpolymer composition an effective amount of a complex organic polyphosphoric ester acid anhydride.

3,678,021

PROCESS FOR PREPARING VINYL BASED POLYMERS AND COPOLYMERS INSOLUBLE IN THEIR MONOMERS

Jean Chatelain, Lyon, and Salomon Soussan, Saint-Fons, both of France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Neuillynsur-Seine, France

Filed Jan. 19, 1970, Ser. No. 3,890
Claims priority, application France, Jan. 21, 1969, 6901008; Oct. 30, 1969, 6937326; Oct. 30, 1969, 6937327
Int. Cl. G08f *1/04, 3/30*
U.S. Cl. 260—80.81 2 Claims



Process for preparing vinyl based polymers and copolymers which are insoluble in their monomeric compositions comprising dispersing a small amount of a suspension of an aqueous solution of at least a portion of a catalytic system in a finely divided manner in a composition of the monomer or comonomer and then polymerizing the composition to form polymer.

3,678,022

POLYMERIZING UNSATURATED MONOMERS WITH A CATALYST OF AN IRON COMPLEX, A DIALKYL ALUMINUM COMPOUND AND A BIDENTATE LIGAND

John E. Bozik, Pittsburgh; Harold E. Swift, Gibsonia, and Ching Yong Wu, Pittsburgh, all of Pa., assignors to Ameripol, Inc.

Division of Ser. No. 812,536, March 10, 1969, Pat. No. 3,565,875. This application July 9, 1970, Ser. No. 61,011
Int. Cl. C08f *3/22, 3/74*
U.S. Cl. 260—88.7 9 Claims

Process for polymerizing olefins, diolefins and alkylene oxides in the presence of a catalyst system comprised of an iron complex, a trialkyl aluminum compound and a bidentate ligand capable of both p i ($\pi$and sigma (σ) banding to form a five or six-membered ring.

3,678,023

PROCESS FOR THE PRODUCTION OF FREE-FLOWING, GRANULAR, ATACTIC POLYBUTENE-1

Albert Frese, Marl, Germany, assignor to Chemische Werke Huels Aktiengesellschaft Patentabteilung, Marl, Germany

Filed Sept. 25, 1970, Ser. No. 75,735
Claims priority, application Germany, Sept. 26, 1969, P 19 48 623.8
Int. Cl. C08f *1/42, 1/92, 3/12*
U.S. Cl. 260—93.7 10 Claims

Free-flowing, granular atactic polybutene-1 is produced by low-pressure polymerizing butene-1 with a mixed titanium or vanadium halide and alkylaluminum catalyst to a solids content of up to 200 g./l. using a liquefied gas as diluent; and thereafter adding an alkanol of one to four carbon atoms to the polymerization mixture in an amount at least 4 times the weight of the polymer under high agitation.

3,678,024

CROSSLINKING OF ETHYLENE POLYMERS WITHOUT A CROSSLINKING AGENT

Gordon Y. T. Liu, and Carl P. Strange, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 5, 1970, Ser. No. 785
Int. Cl. C08f *3/02, 3/04, 27/00*
U.S. Cl. 260—94.9 GA 8 Claims

Ethylene polymers are crosslinked in the absence of crosslinking agents by working the normally solid olefin polymer, e.g., polyethylene, at temperatures just above the melting point of the polymer and at higher than normal shear rates, e.g., greater than 3,000 sec^{-1}.

3,678,025

PREPARATION OF LINEAR ALPHA OLEFIN POLYMERS HAVING BROAD MOLECULAR WEIGHT DISTRIBUTIONS

George B. Birrell, Eugene, Oreg., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 22, 1970, Ser. No. 39,890
Int. Cl. C08f *1/56, 3/06*
U.S. Cl. 260—94.9 E 14 Claims

Linear alpha olefin polymers having controlled broad molecular weight distributions are prepared by an improved process in which a zirconium catalyst composition, e.g., the reaction product of zirconium tetrachloride and aluminum triethyl, and another transition metal catalyst composition, e.g., the reaction product of vanadium oxytrichloride and aluminum triethyl, are introduced into a polymerization zone containing an alpha olefin in an inert organic solvent and the alpha olefin is subsequently polymerized at temperatures sufficient to maintain the resulting alpha olefin polymer in solution. Such alpha olefin polymers are found to have a wider variety of uses, e.g., from cable jacketing to bottle blowing applications, than alpha olefin polymers produced by conventional low pressure polymerization.

3,678,026

METHOD OF PURIFYING LOWER ALKYL ESTERS OF α-L-ASPARTYL-L-PHENYLALANINE

Yasuo Ariyoshi; Tetsuo Yamatani; Noboru Uchiyama, all of Kanagawa-ken, and Sato Naotake, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Dec. 28, 1970, Ser. No. 102,184
Claims priority, application Japan, Dec. 30, 1969, 44/1753
Int. Cl. C07c *103/52*; C07g *7/100*
U.S. Cl. 260—112.5 3 Claims

The lower alkyl esters of α-L-aspartyl-L-phenylalanine, known artificial sweeteners, are separated from the bitter tasting β-isomers and other impurities by the low solubility of their adducts with certain aromatic carboxylic acids and phenols in water.

3,678,027

ADSORPTION COMPLEXES OF PEPTIDES HAVING ADRENOCORTICOTROPIC HORMONE ACTIVITY

Evert De Jager, and Jan Daniel Herman Homan, both of Oss, Netherlands, assignors to Organon Inc., West Orange, N.J.

Continuation-in-part of Ser. No. 341,128, Jan. 29, 196- , abandoned. This application June 30, 1967, Ser. No. 650,192
Claims priority, application Netherlands, Feb. 15, 1966, 289,055
Int. Cl. A61k *17/16*; C07c *103/52*
U.S. Cl. 260—112.5 5 Claims

An injectable preparation suitable for hormone therapy is provided by a suspension in an aqueous injectable vehicle of an adsorption complex of a salt, hydroxide or oxide of zinc, nickel, cobalt, copper or iron and a peptide having ACTH activity with an amino acid sequence of at least that of the first 19 and not more than that of the first 31 amino acid residues of the ACTH molecule, the amount of metal being between about 1 and 20 mg. per 100 U.S.P. units of peptide.

3,678,028

PREPARATION OF WATER-INSOLUBLE MONO-AND DIS-AZO DYES

John Blackwell, Kennett Square, Pa., and Alfred Tropea, Gibbstown, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 1, 1970, Ser. No. 42,559
Int. Cl. C09b *31/04*
U.S. Cl. 260—186 8 Claims

In an improved process for preparing water-insoluble azo dyes by diazotizing a first aromatic amine with sodium nitrite and coupling the diazonium salt thus produced to a second aromatic amine or active methylene coupling component, the improvement consisting of carrying out at least the diazotization reaction in a mixture of acetic acid and trichloroethylene and, optionally, a mineral acid, the weight ratio of acetic acid to trichloroethylene being within the range of 4:1 to 1:7.

3,678,029

ESTROGEN GLUCOSAMINIDES OF 2-AMINOGLUCOSE

Joseph Peter Joseph, Cliffside, N.J.; John Paul Dusza, Nanuet, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 15, 1970, Ser. No. 3,219
Int. Cl. C07c *173/00*
U.S. Cl. 260—210.5 9 Claims

The preparation of steroidal-glucopyranosides by the reaction of an estradiol or substituted estradiol with a glucopyranose and subsequent transformations is described. These compounds are useful for their antifungal properties.

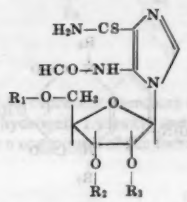
3,678,030

IMIDAZOLE DERIVATIVES INHIBITING NF SARCOMA

Akihiro Yamazaki; Teruo Furukawa, and Izumi Kumashiro, all of Kanagawa, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 27, 1970, Ser. No. 15,245
Int. Cl. C07d *51/50*
U.S. Cl. 260—211.5 R 4 Claims

Imidazole derivatives of the formula (I)



(I)

wherein R_1 is lower alkanoyl, and R_2 and R_3 are each lower alkanoyl or jointly lower alkylidene are readily prepared by reaction of formic acid with corresponding starting compounds having an amino group in position 5 of the imidazole ring, and hydrogen or lower alkanoyl groups instead of each of R_1, R_2, R_3 or alkylidene in R_2 and R_3. They inhibit the growth of NF sarcoma in mice.

3,678,031

SLURRY PROCESS FOR THE PRODUCTION OF ABSORPTIVE CARBOXY METHYL CELLULOSE FIBERS

Howard L. Schoggen, Memphis, Tenn., assignor to The Buckeye Cellulose Corporation, Cincinnati, Ohio

Filed Oct. 21, 1970, Ser. No. 82,797
Int. Cl. C08b *11/00*
U.S. Cl. 260—231 CM 6 Claims

Alkali metal salts of carboxymethyl cellulose are prepared by producing and then etherifying alkali cellulose under conditions selected to result in a molar excess of neutralized acidic etherifying reagent to moles of unreacted neutralizing reagent together with extended etherifying time and temperature conditions, i.e., about 3 to about 24 hours at about 60°C. to about 80°C. to yield substantially insoluble acidic products, which products are white in color, have a reflectance brightness of about 70 to about 80, have a normally soluble degree of substitution range of about 0.4 to 1.2 and are absorptive and retentive of up to about 70 times their weight of aqueous solutions.

3,678,032

α,α-DIALKANOYLOXYACETYL PENICILLANIC ACID DERIVATIVES

Ronald J. McCaully, Malvern, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed May 15, 1970, Ser. No. 37,910
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 3 Claims

Novel penicillin type compounds are prepared by the α,α-dialkanoyloxyacetylation of amino substituted penicillanic acid derivatives. The compounds are useful as antibacterial agents.

3,678,033

7-NITRO-1H-1, 5-BENZODIAZEPINE-2,4-(3H,5H)-DIONES

Karl-Heinz Weber, Gau-Algesheim; Adolf Bauer; Herbert Merz, both of Ingelheim, Rhine, and Klaus Minck, Gau-Algesheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim, Rhine, Germany

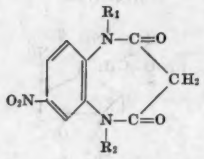
Filed Feb. 2, 1971, Ser. No. 112,070

Claims priority, application Germany, Feb. 13, 1970, P 20 06 601.7

Int. Cl. C07d *53/04*

U.S. Cl. 260—239.3 B 10 Claims

Compounds of the formula



wherein

R_1 is hydrogen, straight or branched alkyl of one to four carbon atoms, hydroxy-(alkyl of one to four carbon atoms), methoxy-(alkyl of one to four carbon atoms), acetoxy-(alkyl of one to four carbon atoms), cyclopropyl-methyl, cyclohexyl or allyl, and

R_2 is hydrogen, phenyl, o-halo-phenyl, o-trifluoromethyl-phenyl, o-nitro-phenyl, o-cyano-phenyl or pyridyl,

provided, however, that R_1 and R_2 are other than both hydrogen at the same time; the compounds are useful as psychosedatives and anticonvulsives.

3,678,034

2-CHLORO-Δ1,4-STEROIDS

Henry Laurent; Karl Heinz Kolb, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Berg Kamen, Germany

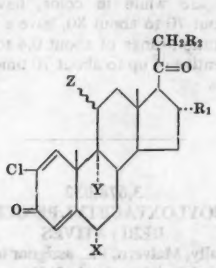
Filed April 22, 1970, Ser. No. 30,934

Claims priority, application Germany, April 23, 1969, P 19 21 397.9; April 23, 1969, P 19 21 398.0; June 19, 1969, P 19 31 508.3

Int. Cl. C07c *169/32*

U.S. Cl. 260—239.55 37 Claims

Novel 2-chloro-Δ1,4-steroids having the formula



(I)

wherein R_1 is hydrogen or methyl, R_2 is hydrogen, hydroxyl or esterified hydroxyl, X is fluorine, chlorine or methyl, Y is hydrogen or halogen, and Z is halogen having the same or a smaller atomic weight then Y, a β-position hydroxyl and in the case where Y is hydrogen, an α-position hydroxyl.

3,678,035

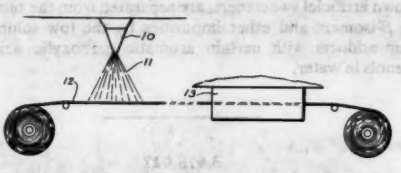
CARBOXAMIDO-AZIRIDINE COMPOUNDS

Dilip K. Ray-Chaudhuri, Somerset, and Hans H. Stockmann, Plainfield, both of N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 690,838, Dec. 15, 1967, abandoned. This application July 15, 1970, Ser. No. 55,137

Int. Cl. C07d *23/08*

U.S. Cl. 260—239 E 1 Claim



Carboxamido-aziridine compounds comprising the products resulting from the reaction of an alkylenimine such as ethylenimine with an intermediate adduct comprising the reaction product of an non-florinated alcohol reagent such as lauryl alcohol and a polyisocyanate reagent such as tobylene diisocyanate. The resulting carboxamido compounds impart water repellency to a wide variety of substrates.

3,678,036

2-SUBSTITUTED AMINO-1,4-BENZODIAZEPINE

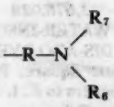
Giles Allan Archer, Essex Fells, and Leo Henryk Sternbach, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. Nos. 208,951, Sept. 10, 1962, Pat. No. 3,422,091, and Ser. No. 323,884, Nov. 15, 1963, abandoned. This application Sept. 20, 1968, Ser. No. 761,307

Int. Cl. C07d *53/06, 57/00, 99/02*

U.S. Cl. 260—239 BD 15 Claims

1,4-Benzodiazepines bearing in position-2, either a disubstituted amino group or an



group wherein R is lower alkylene and R_6 and R_7 are either lower alkyl or together with the nitrogen atom form a heterocyclic moiety or an NH-R-phenyl grouping wherein R is as above and certain 4-oxides thereof. Such compounds are useful as muscle relaxants, sedatives and anticonvulsants.

3,678,037

PROCESS FOR PRODUCING α-AMINO PENICILLIN INTERMEDIATES

Charles A. Robinson, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 4,161, Jan. 14, 1970, abandoned, Continuation of Ser. No. 671,938, Oct. 2, 1967, abandoned. This application Aug. 10, 1970, Ser. No. 62,682

Int. Cl. C07d *99/16*

U.S. Cl. 260—239.1 17 Claims

A method for preparing organosilane derivatives of α-amino penicillins comprising preparation of an amine base salt of 6-aminopenicillanic acid by reacting the latter with a strong amine in an organic solvent devoid of hydroxyl groups; adding to the resulting mixture of the amine base salt of 6-aminopenicillanic acid, which has had added thereto a weak amine base, a mono- or multi-functional halosilane; incorporating a mineral acid salt of a weak amine in the mixture; and then adding to the last resulting mixture the chloride hydrochloride of a suitable α-amino acid to form by acylation

the organosilane derivatives of the hydrochloride of the desired α-amino penicillin. The resulting silylated and silenated penicillin hydrochlorides are useful for conversion into the corresponding α-amino penicillin having potent antibiotic activity, by simple hydrolysis or alcoholysis, followed either by transformation of the resulting penicillin hydrochloride into an aryl sulfonic acid salt thereof which may be neutralized to the penicillin per se by addition of a suitable base, or by the raising of the pH of the reaction mixture to the iso-electric point to cause precipitation of the desired penicillin.

3,678,038

1,4-BENZODIAZEPIN-5-ONES AND METHODS FOR THE PREPARATION THEREOF

George Francis Field, Arlesheim, Switzerland; Leo Henryk Sternbach, Upper Montclair, and William Joseph Zally, Union City, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 718,259, April 2, 1968, Pat. No. 3,624,073, which is a continuation-in-part of Ser. No. 665,716, Sept. 6, 1967, abandoned. This application April 1, 1971, Ser. No. 130,445

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 D 7 Claims

1,4-Benzodiazepin-5-ones and methods for their preparation are disclosed. These compounds are useful as intermediates in the preparation of known and pharmacologically valuable 5-substituted-1,4-benzodiazepines.

3,678,039

4-TRIFLUOROMETHYL-ANTHRANILIC ACIDS

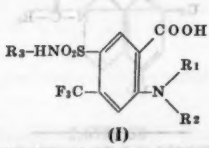
Lincoln Harvey Werner, 94 Larned Road, and George De Stevens, 2 Warwick Road, Woodland Park, both of Summit, N.J.

Continuation-in-part of Ser. No. 606,599, Jan. 3, 1967, which is a continuation-in-part of Ser. No. 553,703, May 31, 1966, abandoned, which is a continuation-in-part of Ser. No. 508,556, Nov. 18, 1965. This application April 27, 1967, Ser. No. 634,101

Int. Cl. C07d *5/14*

U.S. Cl. 260—239.6 9 Claims

5-Sulfamyl-4-trifluoromethyl-anthranilic acids of the formula I



(I)

R_1 = aliphatic or araliphatic hydrocarbon radical or aryl

$R_{2,3}$ = H, aliphatic or araliphatic hydrocarbon or acyl radical or aryl

esters and salts thereof, particularly the N-furfuryl-4-trifluoromethyl-5-sulfamyl-anthranilic acid, exhibit diuretic effects.

3,678,040

PROCESS FOR THE PREPARATION OF HYDROXYBENZENE SULFONATES OF MORPHOLINOMETHYL AMINOOXAZOLIDONES

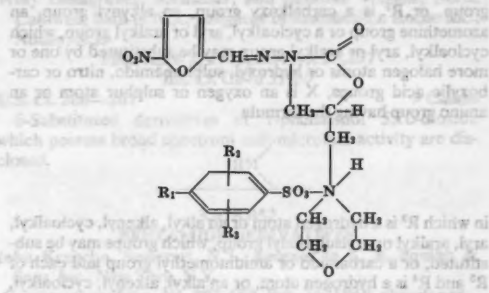
Antonio Esteve, and Jose M. Espinos, both of Barcelona, Spain, assignors to Laboratorios del Dr. Esteve, S.A., Barcelona and Laboratorios Espinos y Bofill S.A., Cornella, Spain

Filed July 25, 1967, Ser. No. 655,772

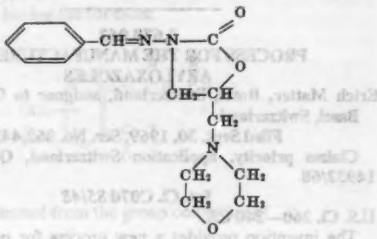
Int. Cl. C07d *87/46*

U.S. Cl. 260—240 A 6 Claims

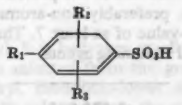
Anti-microbial and anti-haemmorhagic hydroxybenzene sulfonates of morpholinomethyl 3-amino-2-oxazolidones having the general formula:



in which R_1, R_2 and R_3 represent members selected from the group consisting of hydrogen, hydroxyl and sulfonic acid are obtained by reacting a compound of the formula:



with a sulfonic acid of the formula:



and reacting the product with 5-nitrofurfural.

3,678,041

SUBSTITUTED THIAZOLIDINE-4-ONES

Max J. Mousseron, Montpellier, Herault, France, assignor to Etablissements Clin-Byla, Paris, France

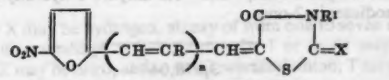
Filed June 3, 1968, Ser. No. 733,808

Claims priority, application France, June 6, 1972, 72109263

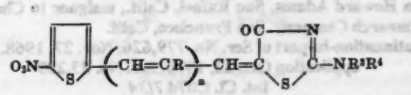
Int. Cl. C07d *91/14*

U.S. Cl. 260—240 A 4 Claims

Highly active antibacterials are described which are 5-substituted thiazolidine-4-ones having one of the formulas



and



in which n is 0 or 1, R is a hydrogen atom or a bromine atom, R^1 is a hydrogen atom, an alkyl, or alkenyl group which may

be substituted by a halogen atom, or a hydroxyl, a carboxylic acid, carboxamide, substituted carboxhydrazide or carboxylic acid ester group or a primary, secondary or tertiary amino group, or R^1 is a carbalkoxy group, an alkynyl group, an azomethine group or a cycloalkyl, aryl or aralkyl group, which cycloalkyl, aryl or aralkyl group may be substituted by one or more halogen atoms or hydroxyl, sulphonamido, nitro or carboxylic acid groups, X is an oxygen or sulphur atom or an amino group having the formula

in which R^2 is a hydrogen atom or an alkyl, alkenyl, cycloalkyl, aryl, aralkyl or arylsulphonyl group, which groups may be substituted, or a carbamido or amidinomethyl group and each of R^3 and R^4 is a hydrogen atom, or an alkyl, alkenyl, cycloalkyl, aryl or aralkyl group, which group may be substituted, or R^3 and R^4 together with the nitrogen atom to which they are attached form a heterocyclic ring. Tests are described in which activity against a large number of gram positive and gram negative bacteria are reported.

3,678,042

PROCESS FOR THE MANUFACTURE OF ARYLOXAZOLES

Erich Matter, Basel, Switzerland, assignor to Ciba Limited, Basel, Switzerland

Filed Sept. 30, 1969, Ser. No. 862,442

Claims priority, application Switzerland, Oct. 7, 1968, 14932/68

Int. Cl. C07d *85/48*

U.S. Cl. 260—240 CA **9 Claims**

The invention provides a new process for preparation of aryloxazoles by ring closure reaction between an o-hydroxyamino benzene and a carboxylic acid. The improvement over known processes consists in performing the reaction in a two-step heating procedure and in the presence of small amounts of specific amines, preferably non-aromatic cyclic nitrogen bases, having a P_k-value of at least 7. The reaction products are valuable optical whitening agents.

3,678,043

2,3-DIHYDRO-2-OXO-1H-1,4-BENZODIAZEPINE-3-CARBOXYLIC ACID ESTERS AND RELATED COMPOUNDS

Ronald J. McCaully, Malvern, Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed March 14, 1966, Ser. No. 533,854

Int. Cl. C07d *41/00*

U.S. Cl. 260—239.3 D **13 Claims**

The disclosure is directed to 2,3-dihydro-2-oxo-1H-1,4-benzodiazepine-3-carboxylic acid esters; 2,3-dihydro-3-hydroxy-2-oxo-1H-1,4-benzodiazepine-3-carboxylic acid esters and 3-alkoxy-2,3-dihydro-2-oxo-1H-1,4-benzodiazepine-3-carboxylic acid esters and to novel methods for their preparation. The compounds have therapeutic activity as central nervous system depressants and as intermediates in the production of 3-alkoxy-1,3-dihydro-2H-1,4-benzodiazepin-2-ones, and 1,3-dihydro-3-hydroxy-2H-1,4-benzodiazepin-2-ones.

3,678,044

SUBSTITUTED FLAVANONES

John Howard Adams, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 779,626, Nov. 27, 1968. This application Oct. 22, 1970, Ser. No. 83,209

Int. Cl. C07d *7/34*

U.S. Cl. 260—240 F **6 Claims**

Substituted arylidene flavanones are provided which are useful as oxidation inhibitors for hydrocarbon compositions.

3,678,045

METHINE DYES FOR USE IN PHOTOGRAPHY

Earl J. Van Lare, and Leslie G. S. Brooker, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 680,974, Nov. 6, 1967, Pat. No. 3,576,640. This application June 1, 1970, Ser. No. 54,070

Int. Cl. C07d *57/40*

U.S. Cl. 260—240.4 **8 Claims**

Methine dyes derived from 1-alkyl-3-alkyl-8-alkyl-9-alkylxanthine are advantageously used in photographic hydrophilic colloid layers as spectral sensitizers for silver halide and in hydrophilic colloid light filtering layers.

3,678,046

N-ACYL-3,4-DIHYDRO-OXAZINE-(1,3) COMPOUNDS FOR CONTROLLING PHYTOPATHOGENIC FUNGI

Helmut Huber-Emden, Basel, Switzerland, assignor to Ciba Limited, Basel, Switzerland

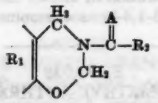
Filed April 27, 1970, Ser. No. 32,415

Claims priority, application Switzerland, April 29, 1969, 6559/69

Int. Cl. C07d *87/14*

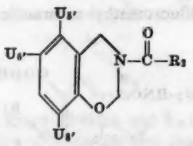
U.S. Cl. 260—244 R **3 Claims**

N-acyl-3,4-dihydro-oxazine-(1,3)-derivatives of the formula



in which A represents a sulphur or an oxygen atom, R_1 indicates a six-membered ring condensed with the dihydro-oxazine ring and R_2 represents an aliphatic or aromatic residue are very effective compounds for controlling plantpathogenic fungi.

Particularly useful are those new compounds of the formula



3,678,047

ALKYLHYDROXYPHENYLCARBOALKOXY-SUBSTITUTED ISOCYANURATES

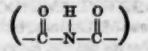
George Kletecka, Lakewood, and Peter D. Smith, Cleveland, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed April 27, 1970, Ser. No. 32,435

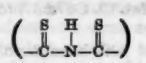
Int. Cl. C07d *55/38*

U.S. Cl. 260—248 NS **7 Claims**

Compounds containing one or more alkylhydroxyphenyl groups bonded through carboalkoxy linkages to a nitrogen atom of a heterocyclic nucleus containing an imidodicarbonyl



group or an imidodithiocarbonyl



group have been prepared and are extremely effective stabilizers against the deleterious effects of oxygen, heat and light for organic materials. The stability of polymeric compositions such as α-olefin polymers and copolymers, acetal polymers, polyamides, polyesters and polyurethanes is markedly increased by the addition of small amounts of the present compounds thereto.

3,678,048

PREPARATION OF TERTIARY AMINOALKYL DERIVATIVES OF SUBSTITUTED ACETOHYDROXAMIC ACID ESTERS

Joseph Levy, Paramus, N.J., and James Psihas, New York, N.Y., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed March 23, 1970, Ser. No. 21,998
Int. Cl. C07d 87/42
U.S. Cl. 260—247.2 B **12 Claims**

Tertiary aminoalkyl derivatives of substituted acetohydroxamic acid esters are prepared by reacting an alkyl ester of a substituted acetohydroxamic acid with an acid salt of a tertiary aminoalkyl halide in a dipolar aprotic solvent medium in the presence of an acid acceptor compound.

3,678,049

POLYMERIZATION OF AROMATIC NITRILES IN 2-PYRROLIDINONE AS SOLVENT AND CATALYST AT ELEVATED TEMPERATURES

Klaus H. Gump, Gillette, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 8, 1970, Ser. No. 96,232
Int. Cl. C07d 55/12
U.S. Cl. 260—248 CS **13 Claims**

Aromatic nitriles, such as benzonitrile, are temperature-selectively polymerized in 2-pyrrolidinone at temperatures above 200°C. At temperatures between about 200° to 350°C. trimerization to a cyclic substituted 1,3,5-triazine occurs. At temperatures above 300°C., imidization occurs, producing a black, non-melting linear poly-(aryl)-carbimide which is soluble only in strong acids and is thermogravimetrically stable up to 600°C. At 300°–350°C., mixtures of trimers and polymeric imides are produced and are separable by sublimination or extraction with aromatic hydrocarbons.

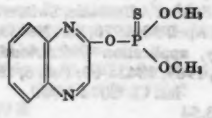
3,678,050

PREPARATION OF O,O-DIMETHYL-THIONOPHOSPHORIC ACID [O-QUINOXALYL-(2)] ESTER

Pierre Gagnaux, Bottmingen, Switzerland, assignor to Sandoz Ltd., (also known as Sandoz AG), Basel, Switzerland

Filed Jan. 20, 1970, Ser. No. 4,423
Claims priority, application Switzerland, Jan. 28, 1969, 1250/69
Int. Cl. C07d 51/78
U.S. Cl. 260—250 R **3 Claims**

The invention concerns a novel process for the production of O,O-dimethyl-thionophosphoric acid [O-quinoxalyl-(2)] ester of the formula:



I

The compound is an insecticide and acaricide.

3,678,051

DERIVATIVES OF 1,6-PHENAZINEDIOL 5,10-DIOXIDE

Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed April 2, 1970, Ser. No. 25,297
Int. Cl. C07d 51/80
U.S. Cl. 260—267 **9 Claims**

6-Substituted derivatives of 1-phenazinol 5,10-dioxide which possess broad spectrum anti-microbial activity are disclosed.

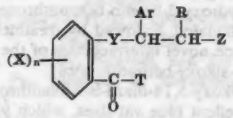
3,678,052

BENZAMIDE DERIVATIVES

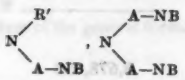
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

Continuation of Ser. No. 802,650, Feb. 26, 1969, abandoned, which is a continuation-in-part of Ser. No. 546,179, April 29, 1966, abandoned. This application June 11, 1970, Ser. No. 48,841
Int. Cl. C07d 51/70
U.S. Cl. 260—268 R **7 Claims**

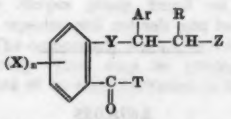
Compounds having the formula:



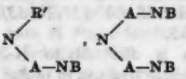
wherein T is selected from the group consisting of



and NB; Ar is phenyl: R is hydrogen or alkyl of from one to three carbons; R′ is selected from the group consisting of hydrogen, lower alkyl, monohalo-lower alkyl and butoxybenzyl; X is identically selected from the group consisting of hydrogen, alkoxy, halo, or trifluoromethyl; *n* is one to four; Y is selected from the group consisting of thia, sulfone, sulfoxide and oxa; Z is selected from the group consisting of nitro, amino and diloweralkylamino; A is ethylene or propylene and mono NB is an N containing, saturated heterocyclic, dilower alkylamino or N methyl N phene ethyl, bis NB is dilower alkylamino and non-toxic mono acid-addition salts, and methyl quaternary salts thereof are disclosed as having CNS modifying activity. The compounds have the formula



wherein X may be hydrogen, alkoxy of from one to seven carbons, trifluoromethyl or halo; *n* may be 1 or 2; Ar may be phenyl; Z may be nitro, amino or diloweralkylamino; T may be



or NB; R′ may be hydrogen, alkyl or monohalolower alkyl of from one to seven carbons or butoxybenzyl; A may be

ethylene or propylene and mono NB may be pyrrolidino, N-lower alkyl piperazino wherein the alkyl radical has less than eight carbons and diloweralkylamino wherein the alkyl radical has less than eight carbons, bis NB may be dilower alkylamino wherein the alkyl has less than eight carbons, and non-toxic mono acid-addition salts, and methyl quaternary salts thereof.

3,678,053

6,15 DIALKOXY 5,14 DIAZO ISO VIOLANTHRONES

Gioacchino Boffa, Novara; Argento Crotti, Cogliate; Giampiero Pieri, Saronno; Angelo Mangini, and Antonio Tundo, both of Bologna, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed Aug. 5, 1970, Ser. No. 69,519

Claims priority, application Italy, Aug. 5, 1969, 20581A/69; June 10, 1970, 25757A/70

Int. Cl. C07d *39/00*

U.S. Cl. 260—272 8 Claims

A novel class of compounds are provided which are 6,15-dialkoxy-5,14-diaza-isoviolanthrones. The compounds are synthesized from 1-aza-2-hydroxy-benzanthrone via a novel process comprising bromination of the starting material to form 1-aza-2-hydroxy-3-bromo-benzanthrone; the hydroxy group is then alkylated, followed by treatment with sodium sulfide to produce novel intermediates of the invention, 3,3-thio-bis(1-aza-2-alkoxy-benzanthrones).

The 6,15-dialkoxy-5,14-diaza-isoviolanthrones of this invention are excellent blue vat dyes, which yield bright blue shades on cellulosic fibers. The dyeings have been found to possess excellent fastness properties.

3,678,054

PROCESS FOR THE MANUFACTURE OF 6-NITRO-9-AMINO-2-ETHOXY-ACRIDINE

Rudolf Neeb, Oberishausen, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt Main, Germany

Filed Oct. 9, 1970, Ser. No. 90,176

Claims priority, application Germany, Oct. 16, 1969, 19 52 0866

Int. Cl. C07d *37/24*

U.S. Cl. 260—279 R 2 Claims

Process for the manufacture of 6-nitro-9-amino-2-ethoxy-acridine, wherein 6-nitro-9-chloro-2-ethoxyacridine is reacted with urea in a polar organic solvent in the presence of salts of weak bases with strong acids and, if desired or required, in the presence of catalytic amounts of an aromatic mono- or polyhydroxy compound.

3,678,055

N-2,3-DIBROMOPROPENYL PYRIDINIUM, QUINOLINIUM AND ISOQUINOLINIUM DERIVATIVES

Frank Passal, Detroit, and Arthur J. Tomson, Novi, both of Mich., assignors to M & T Chemicals Inc., New York, N.Y.

Division of Ser. No. 387,799, Aug. 5, 1964, abandoned. This application June 12, 1969, Ser. No. 870,954

Int. Cl. C07d *31/26, 33/36*

U.S. Cl. 260—290 R 7 Claims

This invention is directed to N-2,3-dibromopropenyl pyridinium salts which find use in nickel electroplating baths and processes.

The present invention relates to novel compositions of matter and to improved nickel electroplating baths and processes.

3,678,056

PROCESS FOR THE PREPARATION OF 1,2,3,4,5,6-HEXAHYDRO-2,6-METHANO-3-BENZAZOCINES

Noel F. Albertson, East Greenbush, and William F. Wetterau, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 670,391, Sept. 25, 1967, Pat. No. 3,585,203. This application July 2, 1970, Ser. No. 52,092

Int. Cl. C07d *39/00*

U.S. Cl. 260—293.52 4 Claims

Process, and intermediates useful therein, for obtaining certain 1,2,3,4,5,6-hexahydro-8-(H or OH)-2,6-methano-3-benzazocines valuable as pharmaceutical intermediates by catalytic hydrogenolysis of the corresponding N-benzyl compounds, the latter being produced by Grignard reaction of a benzylmagnesium halide with an N-benzyl-pyridinium halide to yield an N-benzyl-2-benzyl-1,2-dihydropyridine, reducing this to the corresponding tetrahydropyridine, and cyclizing this product by heating with a strong mineral acid to obtain the 1,2,3,4,5,6-hexahydro-3-benzyl-8-(H or OH)-2,6-methano-3-benzazocine.

3,678,057

1,3,4,4A,5,9B-HEXAHYDRO-5-PHENYL-2H-INDENO[1,2-C]-PYRIDINES

Anton Ebnother, Arlesheim; Jean-Michel Bastian, and Fulvio Gadient, both of Birsfelden, all of Switzerland, assignors to Sandoz Ltd. also known as Sandoz AG, Basel, Switzerland

Filed March 26, 1970, Ser. No. 23,076

Claims priority, application Switzerland, April 8, 1969, 5258/69; May 6, 1969, 6911/69; June 11, 1969, 8891/69; June 16, 1969, 9145/69; Sept. 9, 1969, 13610/69; Dec. 10, 1969, 18379/69; Dec. 11, 1969, 18422/69

Int. Cl. C07d *39/00*

U.S. Cl. 260—293.54 27 Claims

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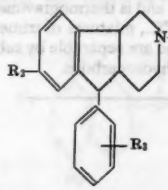
The invention concerns novel (4aRS,5SR,9bSR)- and (4aRS,5SR,9bRS)-1,3,4,4a,5,9b-hexahydro-5-phenyl-2H-indeno[1,2-c]-pyridine compounds of formula:



in which either R_1, R_2 and R_3 are hydrogen, or R_1 is hydrogen, lower alkyl, alkenyl or alkinyl, R_2 is chlorine, bromine, fluorine or lower alkyl, and R_3 is hydrogen, chlorine, bromine, fluorine, lower alkyl, alkylthio or alkoxy, or trifluoromethyl, and acid addition salts thereof.

The compounds exhibit a serotonin-antagonistic effect. Compounds wherein R_1 is hydrogen also exhibit an antiphlogistic effect. Compounds wherein R_1 is lower alkyl, alkenyl or alkinyl also exhibit analgesic properties.

3,678,058

1,3,4,9B-TETRAHYDRO-2(2H)-INDENO-[1,2-C]PYRIDINES

Anton Ebnother, Arlesheim; Jean-Michel Bastian, Birsfelden, and Erwin Rissi, Basle, all of Switzerland, assignors to Sandoz Ltd., (a/k/a Sandoz AG), Basle, Switzerland

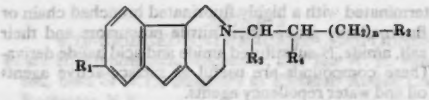
Filed April 30, 1970, Ser. No. 33,498

Claims priority, application Switzerland, May 7, 1969, 6967/69; Dec. 11, 1969, 18424/69; Feb. 5, 1970, 1651/70

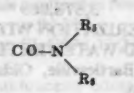
Int. Cl. C07d *39/00*

U.S. Cl. 260—293.54 16 Claims

The invention concerns acid addition salts of novel indenopyridine derivatives of the formula:



wherein R_1 is hydrogen, lower alkyl, fluorine, bromine or chlorine, R_2 is cyano, $COOR_6$ wherein R_6 is hydrogen or lower alkyl, or



wherein R_6 is as above and R_6 is hydrogen or lower alkyl, or R_5 and R_6 together with the nitrogen atom form a heterocyclic ring system with a total of 5 to 7 ring members, R_3 and R_4 are hydrogen or lower alkyl, and n is 0 to 3.

Processes for the production of the said compounds as well as intermediates therefor are described.

The compounds exhibit antiphlogistic, ulcer-protective, hypotensive and anorexigenic effects.

3,678,059

3-AMINOALKYLIDENE-INDAZOLES

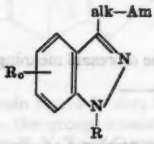
Heinz Werner Gschwend, Millburn, and George De Stevens, Summit, both of N.J., assignors to Ciba-Geigy Corporation, Summit, N.J.

Filed Oct. 7, 1969, Ser. No. 864,525

Int. Cl. C07d *49/18*

U.S. Cl. 260—295.5 B **6 Claims**

3-Aminoalkylidene-indazoles, e.g. those of the formula



Am=an amino group
alk=lower alkylidene
R=araliphatic or aromatic radical
R_o=H, OH, SH, alkyl, alkoxy, alkylmercapto, halogeno, CF_3, NO_2 or amino

acyl derivatives, quaternaries and salts thereof are antidepressants.

3,678,060

PROCESS FOR SEPARATING AN ACID FROM AN AMIDE

Ehud Finkelstein, Edison, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 3, 1970, Ser. No. 60,657

Int. Cl. C07d *31/44*

U.S. Cl. 260—295.5 A **7 Claims**

Process for obtaining an amide from a mixture containing an acid and said amide via an anion exchange resin mechanism.

3,678,061

2,6-BIS(PICRYLAMINO)-3,5-DINITROPYRIDINE AND A METHOD FOR ITS PREPARATION

Michael D. Coburn, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed March 26, 1971, Ser. No. 128,521

Int. Cl. C07d *31/42*

U.S. Cl. 260—297 R **3 Claims**

The heat resistant high explosive 2,6-bis(picrylamino)-3,5-dinitropyridine is readily prepared in good yield by first reacting 2,6-diaminopyridine with picryl chloride in a polar, aprotic solvent such as N,N-dimethylformamide, in the presence of sodium fluoride and then nitrating the resultant intermediate 2,6-bis-(picrylamino)pyridine.

3,678,062

CERTAIN 4-/(INDAZOL-3-YL)-PYRIDINIUM/COMPOUNDS

Victor John Bauer, Montvale, N.J.; William Joseph Fanshawe, and Gretchen Ellen Wiegand, both of Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Sept. 8, 1970, Ser. No. 70,573

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 B **3 Claims**

Quaternary pyridinium salts are prepared by quaternizing the corresponding pyridine compounds which in turn are prepared by various methods. The quaternary salts are useful for lowering blood glucose in warm-blooded animals.

3,678,063

3-(4-PYRIDYL)-4-(2-HYDROXYPHENYL) PYRAZOLE DERIVATIVES

Fernand Binon, Brabant, Belgium, and Jay Morton Beiler, Philadelphia, Pa., assignors to Richardson-Merrell, Inc., New York, N.Y.

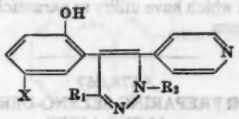
Filed Sept. 24, 1969, Ser. No. 860,789

Claims priority, application Great Britain, Oct. 4, 1968, 47,297/68

Int. Cl. C07d *31/42*

U.S. Cl. 260—296 R **10 Claims**

Pyrazole derivatives of the general formula:



wherein R_1 and R_2 are each hydrogen, methyl, ethyl, n-propyl, isopropyl, or n-butyl and X is hydrogen, hydroxy, methyl, methoxy, chlorine, or bromine, and their acid addition salts, have anti-viral activity against both RNA and DNA viruses such as myxoviruses, adenoviruses, rhinoviruses, and various viruses of the Herpes group based on known testing procedures on experimental animals and human embryonic lung cultures. The compounds are active when administered orally or topically. They may be prepared by heating hydrazine hydrate or an alkyl hydrazine with a 3-benzofuryl ketone.

3,678,064

CERTAIN 2-ACYL-2-THIAZOLINES

Harald Copier, Velp, and Christiaan Herman Theodoor Tousbeek, Zevenaar, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 7, 1970, Ser. No. 1,284

Int. Cl. C07j *91/24*

U.S. Cl. 260—306.7 **4 Claims**

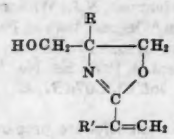
The fried, roast or baked flavor of foodstuffs is improved by adding 2-acyl-2-thiazolines.

3,678,065
PRODUCTION OF HYDROXYMETHYL VINYL OXAZOLINE

John A. Frump, Terre Haute, Ind., assignor to Commercial Solvents Corporation

Filed Dec. 9, 1970, Ser. No. 96,613
Int. Cl. C07d 85/36
U.S. Cl. 260—307 F 11 Claims

A process for the production of hydroxymethyl vinyl oxazolines corresponding to the formula:



where R is methyl, ethyl, or hydroxymethyl and R′ is hydrogen or methyl, comprising reacting an alkanolamine, in which to the carbon atom adjacent to the amino group there are bonded three hydroxyalkyl groups, or two hydroxyalkyl groups and an alkyl group, with an ester of acrylic acid or methacrylic acid in the presence of a catalyst and a polymerization inhibitor, thereby forming an amide, and heating said amide rapidly and briefly to within about 165°–210° C in the presence of additional polymerization inhibitor, thereby forming said hydroxymethyl vinyl oxazoline.

3,678,066
THIOCYANIC ACID ESTERS

Rudiger D. Haugwitz, Highland Park, and Venkatachala Lakshmi, North Brunswick, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed March 6, 1970, Ser. No. 17,320
Int. Cl. C07d 49/38
U.S. Cl. 260—309.2 5 Claims

Disclosed herein are thiocyanic acid esters of benzimidazoles which have utility as parasiticides and anti-inflammatory agents.

3,678,067
METHOD FOR PREPARING SELENO-DERIVATIVES OF γ-AMINO ACIDS

Glenn D. Grummon, Maplewood, and Philip E. Wiegert, St. Louis, both of Mo., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.

Filed Oct. 1, 1969, Ser. No. 862,916
Int. Cl. C07c 101/18, 101/44
U.S. Cl. 260—482 R 5 Claims

Good yields of selenomethionine are obtained by reacting sodium methaneselenol with α-amino-γ-bromobutyric acid or one of its esters. The method is particularly suitable for preparing such compounds containing radioactive selenium. Also, optical isomers of the α-amino acid may be employed without racemization of the product. The sodium methaneselenol may conveniently by prepared in the same reaction vessel by reacting dimethyl diselenide with sodium in liquid ammonia. The method is applicable to preparing seleno derivatives of other α-amino acids.

3,678,068
FLUOROCARBON ACIDS

Louis G. Anello, Basking Ridge, and Richard F. Sweeney, Randolph Township, Dover, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Nov. 1, 1968, Ser. No. 772,844
Int. Cl. C07c 59/22, 69/66, 53/36
U.S. Cl. 260—484 R 7 Claims

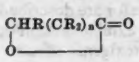
Propionic and butyric acids substituted in the 3- or 4-position, respectively, with a fluorinated alkoxy group, said alkoxy group terminated with a highly fluorinated branched chain or cyclic fluoroalkoxy group, their nitrile precursors and their esters, salt, amide, N-substituted amide and acid halide derivatives. These compounds are useful as surface-active agents and as oil and water repellency agents.

3,678,069
LACTONE POLYMERIZATION WITH A DICARBOXYLIC ACID-WATER INITIATOR

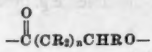
William R. Busler, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Dec. 4, 1968, Ser. No. 781,264
Int. Cl. C07c 69/66
U.S. Cl. 260—484 A 9 Claims

Lactones having the formula:



wherein *n* is an integer from 4 to 6 and the R's are of the group consisting of hydrogen, alkyl, cycloalkyl, alkoxy, and single ring aromatic hydrocarbon radicals are polymerized with an initiator consisting of an organic dicarboxylic acid hydrate or anhydrous dicarboxylic acid and water to produce a product having at least two substantially linear units of the formula:



wherein the variables *n* and R have the aforesaid meanings.

3,678,070
4-OXOPERHYDROBENZO[B]THIOPHENES AND THEIR PREPARATION

Jerry G. Strong, Westfield, and Harold A. Kaufman, Piscataway, both of N.J., assignors to Mobil Oil Corporation

Filed April 28, 1969, Ser. No. 819,982
Int. Cl. C07d 63/04, 63/08
U.S. Cl. 260—332.3 P 6 Claims

Alkyl-substituted 4-oxoperhydrobenzo[b]thiophenes are produced by reacting 2-allyl-2-cyclohexen-1-one, or a derivative having an alkyl substituent on the side chain, with hydrogen sulfide at ambient temperatures. The products can be dehydrogenated to produce 4-hydroxybenzo[b]-thiophene derivatives and converted to carbamate insecticides.

3,678,071
N-HALOIMIDES OF POLYHALO SUBSTITUTED POLYHYDROCYCLICDICARBOXYLIC ACIDS

Irving Touval, Fords, N.J., and Elmar R. Altwicker, Elnora, N.Y., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed May 28, 1969, Ser. No. 828,721
Int. Cl. C07d 27/52, 27/28
U.S. Cl. 260—326 C 6 Claims

Novel compositions of matter comprising N-haloimides of polyhalo substituted polyhydrocyclicdicarboxylic acids, as exemplified by the N-chloroimide of 5,6,7,8,9,9-hexachloro-1,2,3,4,4a,5,8,8a-octahydro-5,8-methano-2,3-naphthalenedicarboxylic acid, are useful as additives to polymeric compositions of matter whereby fire-resistant and flame-retardant properties are added thereto.

3,678,072

9,10-BRIDGED ANTHRACENE COMPOUNDS

Bruce H. Klanderman, Rochester, and Jan W. H. Faber, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 811,655, March 28, 1969, which is a division of Ser. No. 616,789, Feb. 17, 1967, Pat. No. 3,457,235, Continuation-in-part of Ser. No. 530,381, Feb. 28, 1966, abandoned. This application Nov. 30, 1970, Ser. No. 93,814

Int. Cl. C07d 27/28

U.S. Cl. 260—326.5 B 4 Claims

New 9,10-bridged anthracene compounds, such as 9,10-dihydro-9,10-bis(hydroxymethyl)-N-phenyl-9,10-ethanoanthracene-11,12-dicarboximide, for example, improve certain properties of polyesters prepared by polymerization of a dicarboxylic acid, such as terephthalic acid, and an alkylene glycol, such as ethylene glycol, when incorporated in the polymerization mixture.

3,678,073

N,N'-(DIHYDROXY)ETHYLENEBISNORBORNENES

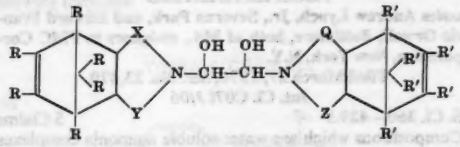
George W. Borden, Charleston, and David J. Trecker, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed April 9, 1970, Ser. No. 27,142

Int. Cl. C07d 27/52

U.S. Cl. 260—326 C 1 Claim

Novel compounds having the formula:



wherein R and R' may be alike or different and are selected from the group consisting of hydrogen and chlorine; and where X, Y, Z and Q may be alike or different and are selected from the group consisting of keto, and alkylene containing one to six carbon atoms.

3,678,074

PROCESS FOR THE MANUFACTURE OF OXIMINO-DITHIOLANES

Erwin Nikles, Liestal, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 24, 1970, Ser. No. 13,764

Claims priority, application Switzerland, Feb. 27, 1969, 2966/69

Int. Cl. C07d 71/00

U.S. Cl. 260—327 M 8 Claims

The invention provides a new cyclization reaction to obtain 4-alkenyl-2-oximino-1,3-dithiolanes by reacting a trans-or cis-1,4-dihalogeno-2-butene with a salt of a dithiocarbamic acid and further reacting the resulting intermediate product 4-alkenyl-2-imino-1,3-dithiolane in the usual way with hydroxylamine.

3,678,075

CARBAMOYLOXIMINO-ALKENYL-DITHIOLANES

Erwin Nikles, Liestal, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Feb. 24, 1970, Ser. No. 13,765

Claims priority, application Switzerland, Feb. 27, 1969, 2966/69

Int. Cl. C07d 71/00

U.S. Cl. 260—327 M 4 Claims

A new group of 2-carbamoyloximino-4-alkenyl-1,3-dithiolanes is disclosed, which are effective pesticidal compounds particularly for controlling soil pests. The compounds are manufactured by reacting a trans- or cis-1,4-dihalogeno-2-butene with a salt of a dithiocarbamic acid to form a 4-alkenyl-2-imino-1,3-dithiolane which is further reacted with hydroxylamine to give the 4-alkenyl-2-oximino-1,3-dithiolane which after reacting with an isocyanate or a carbamic acid chloride yields the desired carbamate.

3,678,076

TETRAHYDRODIBENZOTHIOPHENES

Ronnie R. Crenshaw, Dewitt, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 825,923, May 19, 1969, abandoned. This application Dec. 21, 1970, Ser. No. 100,422

Int. Cl. A61k 27/00; C07d 63/24

U.S. Cl. 260—330.5 9 Claims

d1-cis-4-Methyl-1,2,3,4-tetrahydrodibenzothiophene-3-carboxylic acids and derivatives thereof are compounds which exhibit antifertility activity and which are useful as oral antifertility agents in mammals. An example of a compound of the disclosure is sodium d1-cis-1,2,3,4-tetrahydro-7-methoxy-4-methyldibenzothiophene-3-carboxylate.

3,678,077

9-OXOXANTHEN-2-YL-ALKANOIC ACIDS

Michio Nakanishi, 756 Shinborimachi, Nakatsu, Oita; Takanori Oe, 1336, Oaza-Hirotsu, Yoshitomimachi, Chikujogun, Fukuoka, and Yutaka Maruyama, 3-12-3, Wada, Suginami-ku, Tokyo, all of Japan

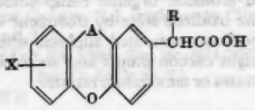
Filed March 27, 1970, Ser. No. 23,458

Claims priority, application Japan, March 29, 1969, 44/24050

Int. Cl. C07d 7/44

U.S. Cl. 260—335 4 Claims

2-arylalkanoic acids of the formula



wherein A id CO or CH_2, R is H or lower alkyl and X is H, lower alkyl or halogen are analgesics, antirheumatics and anti-inflammatory agents.

3,678,078

METHOD FOR THE PREPARATION OF (CIS-1,2-EPOXYPROPYL) PHOSPHONIC ACID PRODUCTS

Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 29, 1969, Ser. No. 795,042

Int. Cl. C07f 9/40, 9/42

U.S. Cl. 260—348 R 9 Claims

A method for the preparation of (cis-1,2-epoxypropyl)-phosphonic dihalide and esters of (cis-1,2-epoxypropyl)-phosphonic acid, which comprises treating 2-hydroxypropionaldehyde with phosphorous trihalide or an ester of phosphorohalidous acid to afford, respectively, (1-formylethyl)-phosphorodihalidite or (1-formylethyl)phosphite, followed by the rearrangement of the said intermediates to yield (cis-1,2-epoxypropyl)phosphonic dihalide or (cis-1,2-epoxypropyl)phosphonate. The dihalide and esterified products thus obtained have utility as intermediates inasmuch as they may be converted by conventional means to (cis-1,2-epoxypropyl)phosphonic acid or to the salts thereof, which products are antibiotics useful in inhibiting the growth of gram-negative and gram-positive pathogenic bacteria.

3,678,079

FIBROUS GLASS FILLED POLYCARBONATE RESINS

Edward J. Carty, Pittsfield, Mass., and Francis C. McDowell, Delmar, N.Y., assignors to General Electric Company

Continuation-in-part of Ser. No. 75,709, Sept. 25, 1970, abandoned. This application Jan. 4, 1972, Ser. No. 215,424
Int. Cl. C08g 51/10
U.S. Cl. 260—37 PC 6 Claims

An aromatic carbonate polymer having uniformly dispersed therein finely divided fibrous glass filaments. The glass filaments employed herein are those that have been treated or coated with a particular binding agent, namely a styrene-ethyl acrylate copolymer.

3,678,080

OXIDATION OF HYDROXYLATED AROMATIC COMPOSITIONS

James V. Crivello, Mechanicville, N.Y., assignor to General Electric Company

Filed Oct. 23, 1969, Ser. No. 868,919
Int. Cl. C07c 41/10, 49/64
U.S. Cl. 260—396 R 10 Claims

Hydroxylated aromatic organic compositions are readily converted to the oxidized state by treatment with a mixture comprising a perchloro saturated aliphatic acid anhydride of from four to eight carbon atoms and an oxidizing agent selected from the class of metal nitrates or ammonium nitrate.

3,678,081

OXIDATION OF HYDROXYLATED AROMATIC COMPOSITIONS

James V. Crivello, Mechanicville, N.Y., assignor to General Electric Company

Filed Oct. 23, 1969, Ser. No. 868,918
Int. Cl. C07c 41/10, 43/22, 49/64
U.S. Cl. 260—396 R 11 Claims

Hydroxylated aromatic organic compositions are readily converted to the oxidized state by treatment with a mixture comprising a perfluoro saturated aliphatic acid anhydride of from four to eight carbon atoms and an oxidizing agent of either metal nitrates or ammonium nitrate.

3,678,082

ESTERIFICATION OF 17-HYDROXY STEROIDS

Hugh L. Dryden, Jr., Deerfield, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed July 30, 1970, Ser. No. 64,904
Int. Cl. C07c 167/28
U.S. Cl. 260—397.5 5 Claims

17-Hydroxy steroids can be esterified in nearly quantitative yields using the appropriate anhydride with 4-dimethylaminopyridine.

3,678,083

PREPARATION OF CARBOXYLIC ACIDS

Michael Dubeck, Birmingham, and Ronald L. Shubkin, Oak Park, both of Mich., assignors to Ethyl Corporation, New York, N.Y.

Filed Dec. 8, 1969, Ser. No. 883,306
Int. Cl. C08h 17/36
U.S. Cl. 260—413 10 Claims

A process for preparing carboxylic acids from about C_{10} and higher olefins, carbon monoxide, and water using a cobalt catalyst in the presence of a pyridine promoter; such that the pyridine:cobalt molar ratio is from 1:1 to 10:1 is disclosed. The process is carried out in the substantial absence of a ketone or ether solvent.

3,678,084

DEODORIZATION OF FATS

Adolph Renold, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 566,493, July 20, 1966. This application Oct. 27, 1969, Ser. No. 869,953
Int. Cl. C11b 3/04
U.S. Cl. 260—424 8 Claims

A composition and process for the purification of fats and oils employing a mixture of fat soluble strong acid, an acidic clay, and a carbohydrate.

3,678,085

PROCESS FOR MAKING GROUP VIII METAL CYANIDES AND GROUP VIII METAL CYANIDE COMPLEXES

Edward A. Rick, Charleston, W. Va.; James E. McKeon, Thornwood, N.Y.; Peter Elton, and Benny J. Argento, both of South Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 8, 1969, Ser. No. 848,684
Int. Cl. C07f 15/00, 15/04; C01c 3/08
U.S. Cl. 260—429 R 7 Claims

A process for the manufacture of Group VIII metal cyanides or metal cyanide complexes wherein cyanogen is reacted with a Group VIII metal or metal complex.

3,678,086

COMPLEXES OF HEAVY METAL SALTS OF ACID PHOSPHATE ESTERS

Charles Andrew Lynch, Jr., Severna Park, and Edward Francis Orwoll, Baltimore, both of Md., assignors to FMC Corporation, New York, N.Y.

Filed March 27, 1970, Ser. No. 23,479
Int. Cl. C07f 3/06
U.S. Cl. 260—429.9 5 Claims

Compositions which are water-soluble ammonia complexes of heavy metal salts of acid phosphate organic esters, the organic groups containing an average of at least three carbon atoms, are used in water solutions to produce weather-resistant flame-retarding treatments for wood and other cellulosic bodies. The organic moieties are preferably chlorinated or brominated to improve their flame retardance.

3,678,087

METAL SALTS OF HALO-SUBSTITUTED POLYHYDROPOLY-CYCLICDICARBOXYLIC ACIDS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 22, 1969, Ser. No. 852,462
Int. Cl. G07f 3/10; C07f 1/08, 15/02
U.S. Cl. 260—435 R 8 Claims

Novel compounds of matter comprising metal salts of halo-substituted polyhydromethanonaphthalene acids as exemplified by the mercury salt of 5,6,7,8,9,9-hexachloro-1,2,3,4,4a,5,8,8a-octahydro-5,8-methano-2,3-naphthalenedicarboxylic acid are useful as fungicidal or other biocidal agents.

3,678,088

POLYCHLORINATED METALLOCENES AND THEIR SYNTHESIS

Frederick L. Hedberg, Tucson, Ariz., and Harold Rosenberg, Dayton, Ohio, assignors to The United States of America as represented by the Air Force

Filed Feb. 24, 1971, Ser. No. 118,495
Int. Cl. C07f 15/02, 15/00
U.S. Cl. 260—429 CY 22 Claims

Novel polychlorinated metallocenes are provided that have the following formulas: $C_5H_{5-m}Cl_mMC_5H_5$ and $(C_5H_{5-n}Cl_n)_2M$, wherein M is iron, ruthenium or osmium, m is an integer from 3 to 5, inclusive, and n is an integer from 2 to 5, inclusive. The

products are prepared by (1) reacting a monochlorometallocene or a 1,1'-dichlorometallocene with an organolithium compound in the presence of a solvent, (2) recovering a 1-chloro-2-lithiometallocene or a 1,1'-dichloro-2,2'-dilithiometallocene depending upon the starting material used, and (3) then reacting one of the latter compounds with a chlorination agent to obtain 1,2-dichlorometallocene or 1,1',2,2'-tetrachlorometallocene. The lithiation step and the chlorination step can then be repeated one, two, 3 or more times, using in each reaction as the starting material the isolated chlorinated product from the prior reaction. The polychlorinated metallocenes are useful in preparing metallocene-containing polymers that are particularly suitable as ablative plastics for heat shields and structural laminates for light weight radiation shields. They also can be used to synthesize high temperature and/or high density fluids as well as for additives for lubricants and as flame retardant additives. The decachlorometallocenes are particularly useful because of their high resistance to oxidation.

3,678,089

FUNCTIONAL GROUP CONTAINING THIOETHER SILANES

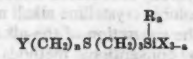
Abe Berger, Schenectady, N.Y., assignor to General Electric Company

Division of Ser. No. 650,632, July 3, 1967, Pat. No. 3,506,674. This application Feb. 3, 1970, Ser. No. 8,405

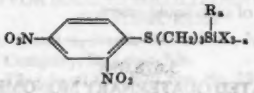
Int. Cl. C07f 7/02, 7/04

U.S. Cl. 260—448.2 N **5 Claims**

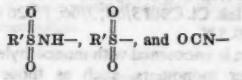
The disclosure relates to compounds within the scope of the following formulas:



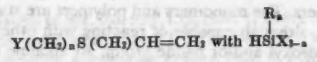
and



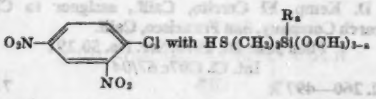
where X is a hydrolyzable radical, R is an organic radical, R' is a lower alkyl radical, Y is selected from the group consisting of



n is equal to 2 or 3 and a is equal to 0 to 2 inclusive. Compounds within the scope of the above formulas can be made by reacting an olefinic thioether of the formula:



in the presence of a platinum compound catalyst and by reacting



in the presence of a basic catalyst. The compounds are useful as glass sizing agents.

3,678,090

AMMOXIDATION OF SATURATED HYDROCARBONS

Keith M. Taylor, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 801,764, Feb. 24, 1969, abandoned, and a continuation-in-part of Ser. No. 787,571, Dec. 27, 1968, abandoned. This application Dec. 17, 1970, Ser. No. 99,298

Int. Cl. C07c 121/02, 121/32

U.S. Cl. 260—465.3 **4 Claims**

Method for the production of acrylonitrile or methacrylonitrile from propane or isobutane employing a catalyst containing antimony and tin or indium.

3,678,091

PROCESS FOR THE PREPARATION OF UNSATURATED ALPHATIC NITRILES BY THE OXIDATION OF OLEFINS

Philippe Reulet, Mourenx; Alain Pfister, Pau; Jacques Tellier, Pau; Jean-Henry Blanc, Pau, all of France; Kirsten Borre Jorgensen, Holte, and Hans Bohlbro, Lyngby, both of Denmark, assignors to Societe Anonyme dite: Societe Nationale Des Petroles D'Aquitaine, Courbevoie, France

Filed June 16, 1969, Ser. No. 833,670

Claims priority, application France, June 19, 1969, 69155509

Int. Cl. C07c 121/02

U.S. Cl. 260—465.3 **11 Claims**

A process for the preparation of unsaturated aliphatic nitriles by the oxidation of olefins in the presence of ammonia, consists in reacting the hydrocarbon or hydrocarbons with oxygen and ammonia in the presence of a catalyst system containing the elements phosphorus, vanadium and molybdenum in the form of a phosphovanadomolyboic heteropolyanion; a part or the whole of said elements may be combined with tellurium or antimony.

3,678,092

3-HYDROXYCYCLOPENTYL-ALKANOIC ACIDS

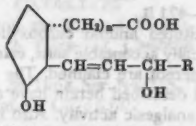
Neville Finch, West Orange, N.J., assignor to Ciba-Geigy Corporation, Summit, N.J.

Filed Feb. 24, 1969, Ser. No. 801,797

Int. Cl. C07c 61/32

U.S. Cl. 260—468 R **4 Claims**

2β-Hydroxyalkenyl-3β-hydroxycyclopentyl-alkanoic acids, e.g. such as those of the formula



R=aliphatic, cycloaliphatic, araliphatic or aromatic radical
n=5-7

and functional derivatives thereof are hypotensives.

3,678,093

PROCESS FOR THE PREPARATION OF 2-(HYDROXYHYDROCARBYL)ACRYLATES

Ken-Ichi Morita; Zennosuke Suzuki, and Hiromitsu Hirose, all of Kamakura-shi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

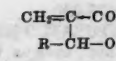
Division of Ser. No. 602,495, Dec. 19, 1966, Pat. No. 3,499,024. This application Oct. 22, 1969, Ser. No. 868,981

Claims priority, application Japan, Dec. 24, 1965, 40/79319; Dec. 25, 1965, 40/79595; March 29, 1966, 41/18933

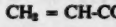
Int. Cl. C07c 69/66, 69/76; C08f 9/74

U.S. Cl. 260—468 R **1 Claim**

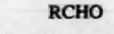
A process for preparing α,β-ethylenically unsaturated compounds of the formula



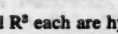
wherein R is a hydrocarbon radical which comprises reacting an α,β-ethylenically unsaturated compound of the formula



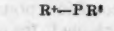
wherein R is as defined above with an aldehyde of the formula



wherein R is as defined above in the process of a catalyst selected from compounds of the formula



wherein R^1, R^2 and R^3 each are hydrocarbyl groups having up to 12 carbon atoms selected from the group consisting of alkyl groups, cycloalkyl groups and aryl groups with the proviso that at least one of the R^1, R^2 and R^3 is an alkyl or cycloalkyl group, and compounds having the formula



wherein R^4 is a hydrocarbyl group having up to 12 carbon atoms selected from the group consisting of alkyl groups and cycloalkyl groups and R^5 is a divalent hydrocarbyl group selected from the group consisting of alkylene and alkenylene groups.

3,678,094

SUBSTITUTED ANILINO CARBOXYLIC ACIDS

Tsung-Ying Shen; Bruce E. Witzel, and Gordon L. Walford, all of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 836,631, June 25, 1969. This application April 20, 1970, Ser. No. 30,321
Int. Cl. C07c *101/54*
U.S. Cl. 260—471 R **4 Claims**

New substituted anilino carboxylic acids and non-toxic pharmaceutically acceptable salts, esters, amides, and various derivatives thereof are claimed. The substituted anilino-carboxylic acids described herein have anti-inflammatory, antipyretic, and analgesic activity. Also included is a method of preparing said anilino carboxylic acids and method of treatment using certain of these substituted anilino carboxylic acids.

3,678,095

SUBSTITUTED DERIVATIVES OF MALONIC ACID USEFUL AS STABILIZERS

Martin Dexter, Briarcliff Manor, and John Denon Spivack, Spring Valley, both of N.Y., assignors to Geigy Chemical Corporation, Greenburgh, N.Y.

Continuation-in-part of Ser. No. 616,801, Feb. 17, 1967. This application July 17, 1970, Ser. No. 55,938
Int. Cl. C07c *69/76*
U.S. Cl. 260—473 S **8 Claims**

Derivatives of malonic acid substituted with groups containing a hindered phenol are disclosed. The compounds are stabilizers suitable for stabilizing numerous substrates of organic material subject to oxidative deterioration, in particular polypropylene. Synergistic combinations of these compounds and dialkyl thiodipropionates are disclosed.

3,678,096

OXIDATION PROCESS FOR THE SYNTHESIS OF α-HYDROXY ESTERS

David J. Trecker, South Charleston, W. Va., and James E. McKeon, Thornwood, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 12, 1969, Ser. No. 849,515
Int. Cl. C07c *69/66*
U.S. Cl. 260—484 R **8 Claims**

A process for the synthesis of α-hydroxy esters of carboxylic acids by reacting a carboxylic acid ester with a hydroperoxide in the presence of a metal ion catalyst. The reaction is characterized by mild reaction conditions and good efficiency. The α-hydroxy esters are useful intermediates in the production of acrylates.

3,678,097

SOLUBLE ALKALI METAL SALT REMOVAL FROM SUBSTANTIALLY NON-POLAR LIQUIDS

Heino Puhk, North Olmsted, Ohio, assignor to SCM Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 709,214, Feb. 29, 1968, abandoned. This application Nov. 25, 1970, Ser. No. 92,842
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R **6 Claims**

A process for removing soluble alkali metals from substantially non-polar organic liquid esters is described. The process comprises adding a hydroxy-substituted lower aliphatic saturated dicarboxylic acid to substantially non-polar liquid esters containing alkali metals in salt form, particularly lithium salts, in solution. The hydroxy-substituted saturated dicarboxylic acids form solid insoluble crystalline alkali metal salts in such liquids permitting the separation of the alkali metal moieties from the medium by conventional methods. The presence of dissolved alkali metal salts is undesirable in that it interferes with the end use of such liquid esters.

3,678,098

UNSATURATED QUATERNARY MONOMERS AND POLYMERS

Sheldon N. Lewis, Willow Grove; Richard F. Merritt, Fort Washington, and William D. Emmons, Huntington Valley, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed April 4, 1969, Ser. No. 813,724
Int. Cl. C08f *3/64, 3/66, 15/26*
U.S. Cl. 260—89.5 N **9 Claims**

This invention is concerned with monoethylenically unsaturated acid ester monomers, such as those of acrylic or methacrylic acid, containing a quaternary ammonium halide group having a substituent on the quaternary nitrogen atom of the formula $-CH_2CH(OH)CH_2X$ wherein X is chlorine, bromine or iodine. It is also concerned with addition polymers of such monomers, and methods of producing the monomers and polymers. The monomers and polymers are stable at acid pH values, although capable of reacting with other reactants for the hydroxyl and/or halide group. At alkaline pH values, they become self-reactive and the polymers crosslink themselves by slow reaction at room temperature. However, the reaction becomes quite rapid on heating.

3,678,099

PROCESS FOR THE ESTERIFICATION OF ISOBUTENE

Jacob D. Kemp, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 26, 1970, Ser. No. 50,291
Int. Cl. C07c *67/04*
U.S. Cl. 260—497 R **7 Claims**

A process for the esterification of isobutene with reduced polymerization of the isobutene which comprises contacting the isobutene with a lower carboxylic acid and an acidic resin catalyst containing a sulfonate group, which catalyst has

between about 0.2 and 2.4 meq. of H+ per gram of catalyst. Preferred carboxylic acids include formic acid and acetic acid and the preferred type catalyst is a resinous sulfonated polystyrene divinyl benzene copolymer.

3,678,100

2-HALOPERFLUORO-1-CYCLOALKEN-1-YL PHOSPHORYL COMPOUNDS AND PROCESS FOR THE PREPARATION THEREOF

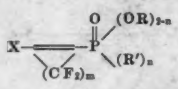
Arlen W. Frank, Grand Island, N.Y., and Charles F. Baranauckas, Memphis, Tenn., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 438,106, March 8, 1965, Pat. No. 3,505,433. This application Sept. 5, 1969, Ser. No. 870,801

Int. Cl. C07f 9/38; C11d 1/34

U.S. Cl. 260—502.4 R 3 Claims

A process for the preparation of a compound selected from the group consisting of 2-haloperfluoro-1-cycloalken-1-ylphosphonic acid and 2-haloperfluoro-1-cycloalken-1-yl phosphinic acid, which comprises hydrolyzing the corresponding compound of the formula



wherein X is selected from the group consisting of chlorine and bromine, R and R′ are organic radicals, *m* is from 2 to 4, and *n* is from 0 to 1.

3,678,101

PROCESS FOR MAKING METHYLOLATED PHENOL-SULFONIC ACID

Raymond D. Beaulieu, North Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed April 17, 1970, Ser. No. 29,646

Int. Cl. C07c 143/42

U.S. Cl. 260—512 R 9 Claims

Process for making aqueous solutions of methylolated phenol sulfonic acid which are substantially free from excess alkali. The process uses hydroxides of Group IIA metals as basic condensation catalysts for CH_2O and phenol-sulfonic acid, and CO_2 to precipitate insoluble carbonate salts at conclusion of condensation.

3,678,102

α,α,α′,α′-TETRASUBSTITUTED CARBOXYLIC DIACIDS AND PROCESS FOR THEIR PREPARATION

Arsene Isard, Saint-Genis-Laval, and Francis Weiss, Pierre-Benite, both of France, assignors to Ugine Kuhlmann, Paris, France

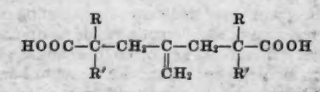
Continuation of Ser. No. 591,135, Nov. 1, 1966, abandoned. This application Sept. 11, 1970, Ser. No. 71,377

Claims priority, application France, Nov. 5, 1965, 6537347; May 3, 1966, 6659972

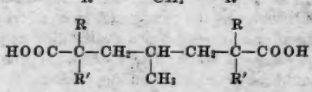
Int. Cl. C07c 57/02, 61/16, 63/60

U.S. Cl. 260—514 R 4 Claims

An α,α,α′,α′-tetrasubstituted γ-methylene (and γ-methyl) pimelic acid of the general formulas:

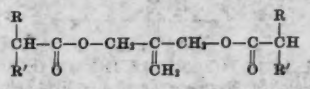


(I)



(II)

And a process for preparing diacid (I) by reacting in an anhydrous medium a diester of the general formula:



with a Grignard reagent R″MgX or with an alkaline metal hydride, amide or alcoholate and then neutralizing and separating. Diacid II being prepared by reduction of diacid (I) such as by catalytic hydrogenation.

3,678,103

AROMATIC AMINE-MODIFIED RESOLE RESINS IN COMBINATION WITH AROMATIC POLYCARBOXYLIC COMPOUNDS

Rodney M. Huck, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed March 12, 1971, Ser. No. 123,883

Int. Cl. C08g 5/18

U.S. Cl. 260—51.5 11 Claims

Thermosettable compositions of an amine-modified resole resin and an aromatic polycarboxylic compound. These compositions can be thermoset by heat with temperatures and times approaching those used for thermosetting ordinary resole resins along and the product thermoset articles display improved thermal stability.

3,678,104

HYDROXYLATION OF AROMATIC ACIDS

Jerome A. Vesely, Park Ridge, and Louis Schmerling, Riverside, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Sept. 29, 1969, Ser. No. 862,007

Int. Cl. C07c 65/02

U.S. Cl. 260—521 R 6 Claims

The nuclear hydroxylation of a nuclearly substituted aromatic acid is accomplished by treating the acid with hydrogen peroxide in the presence of substantially anhydrous hydrogen fluoride at a temperature in the range of from about −10° to about 100° C.

3,678,105

PROMOTION OF LIQUID PHASE OXIDATION CATALYSTS

Louis J. Croce, Seabrook, and Bruno J. Barone, Houston, both of Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Aug. 28, 1968, Ser. No. 755,775

Int. Cl. C07c 63/02

U.S. Cl. 260—524 R 6 Claims

A process for the oxidation of mononuclear aromatic compounds having at least one oxidizable group selected from methyl, hydroxymethyl, and aldehyde, at moderate temperatures, and in the presence of oxygen, cobaltous or cobaltic ions, and an effective amount of a specified substituted acid function.

3,678,106

OXIDATION OF P-XYLENE AND P-TOLUIC ACID TO TEREPHTHALIC ACID IN AQUEOUS MEDIUM

John W. Ager, Princeton, N.J., assignor to FMC Corporation, New York, N.Y.

Filed April 2, 1970, Ser. No. 25,251

Int. Cl. C07c 63/02

U.S. Cl. 260—524 R 5 Claims

Terephthalic acid (TPA) is produced by the oxidation of p-xylene and/or p-toluic acid (PTA) with elemental oxygen in aqueous medium at elevated temperatures and pressures and in the absence of a conventional metal catalyst, using instead

hydrogen bromide as catalyst, preferably together with small amounts of nitric acid. With p-xylene, active charcoal is additionally needed to insure adequate reaction.

3,678,107

PROCESS FOR THE PRODUCTION OF OXALIC ACID

Eiichi Yonemitsu, Kashiwa; Tomiya Isshiki, Tokyo; Tsuyoshi Suzuki, Yokkaichi, and Yukio Yashima, Soka, all of Japan, assignors to Mitsubishi Edogawa Kagaku Kabushiki Kaisha, Tokyo, Japan

Filed March 12, 1970, Ser. No. 19,104

Claims priority, application Japan, Feb. 28, 1970, 45/16694; March 15, 1969, 44.19240

Int. Cl. C07c *51/26*

U.S. Cl. 260—531 R **18 Claims**

A process for the production of oxalic acid wherein ethylene glycol and/or glycolic acid are oxidized in the presence of nitric acid with introduction of oxygen.

Nitrogen oxides gases generated in the process are oxidized to nitric acid with oxygen during the reaction. The process is substantially an oxidation of ethylene glycol and/or glycolic acid by oxygen in an acid medium comprising nitric acid and eliminates the use of the nitric acid regeneration system required in usual nitric acid oxidation.

3,678,108

HYDROGENATION OF NITROBENZENE

Joseph T. Arrigo, Westbury, N.Y., and Nils J. Christensen, Palatine, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed May 13, 1970, Ser. No. 37,022

Int. Cl. C07c *85/10*

U.S. Cl. 260—563 D **10 Claims**

Hydrogenating nitrobenzene to cyclohexylamine using a rhodium catalyst and minimizing the formation of dicyclohexylamine by effecting said hydrogenation in a secondary or tertiary alcohol solvent.

3,678,109

CERTAIN CYCLOHEXYLFORMAMIDINES

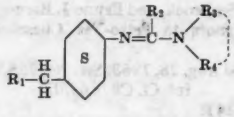
Richard N. Knowles, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed April 20, 1967, Ser. No. 634,037

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 R **8 Claims**

Cyclohexylformamidines of the formula:



wherein

R_1 is alkyl, cycloalkyl, bicycloalkyl, or tricycloalkyl,

R_2 is hydrogen or alkyl,

R_3 is alkyl, and

R_4 is alkyl and can be joined with R_3 to form a saturated ring.

Typical is N,N-dimethyl-N'-(4-cyclohexylmethylcyclohexyl)-formamidine useful for repelling animals.

3,678,110

FLUOROCARBON CONTAINING DIALLYLAMINES

Jerry E. Boothe, Pittsburgh; Merwin F. Hoover, Bethel Park, and Dallas L. Schlegg, Pittsburgh, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Division of Ser. No. 786,747, Dec. 24, 1968, abandoned. This application Nov. 20, 1969, Ser. No. 877,556

Int. Cl. C07c *83/00*

U.S. Cl. 260—567.6 M **3 Claims**

Diallyl quaternary ammonium compounds containing a terminal perfluoroisopropoxide group are disclosed. These compounds are useful in monomeric form and especially in polymeric form as oil and water repellents.

3,678,111

DIALKYLAMINOMETHYLPHENYL BENZYL ALCOHOLS

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Division of Ser. No. 581,152, Sept. 22, 1966, Pat. No. 3,497,508. This application Nov. 17, 1969, Ser. No. 877,454

Int. Cl. C07c *87/28*

U.S. Cl. 260—570 **2 Claims**

Benzyl alcohols substituted by a diakylaminomethylphenyl moiety in the α-position useful as anti-inflammatories and anti-diabetics are obtained by reduction of corresponding benzophenones.

3,678,112

PROCESS FOR PREPARING NUCLEAR ALKYLATED ANILINES AND RECOVERY OF ALUMINA

John C. Wollensak, Bloomfield Hills, and John P. Napolitano, Royal Oak, both of Mich., assignors to Ethyl Corporation, New York, N.Y.

Filed Feb. 4, 1970, Ser. No. 8,686

Int. Cl. C07c *85/00*

U.S. Cl. 264—578 **10 Claims**

In a process for orthoalkylating an aromatic amine such as aniline by reaction of the aromatic amine with an olefin and a catalytic amount of an alkyl aluminum halide, the improvement whereby the catalyst is removed after the alkylation by adding to the reaction mixture aqueous caustic in an amount sufficient to provide from about 1.2–6 equivalents of caustic per equivalent of halogen, aging the caustic treated mixture at about 75°–175° C. for a period of from 15 minutes to 3 hours, separating the aqueous phase and adding to the aqueous phase at a temperature of about 20°–50° C. an amount of a weakly acidic material sufficient to reduce the pH to less than about 9.5, and then filtering off the precipitated alumina. This improved aluminum extraction process allows removal of the aluminum content of the alkylation in a readily recoverable, useful form.

3,678,113

NUCLEARLY ALKYLATED ANILINE RECOVERY PROCESS

Oskar E. H. Klopfer, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 782,706, Dec. 10, 1968. This application Feb. 4, 1970, Ser. No. 8,734

Int. Cl. C07c *87/00*

U.S. Cl. 260—578 **11 Claims**

An improvement in the nuclear orthoalkylation of aromatic amines by reaction of an aromatic amine having a hydrogen atom or a nuclear carbon atom ortho to an amino group (e.g., aniline) with an olefin and a catalytic amount of an alkyl aluminum halide whereby the catalyst is removed from the reaction mixture after completion of the alkylation by washing the reaction mixture with water. The water wash phase separates readily without the necessity of adding caustic.

3,678,114

PROCESS FOR THE PREPARATION OF TRIAMINOBENZENE

John Miller, Mapperley, and Martin Searle, Loughborough, both of England, assignors to Fisons Limited, Felixstowe, Suffolk, England

Filed Feb. 3, 1970, Ser. No. 8,430

Claims priority, application Great Britain, Feb. 18, 1969, 8,821/69

Int. Cl. C07c *85/10*

U.S. Cl. 260—580 10 Claims

Triaminobenzene is prepared by the hydrogenation of an aqueous solution of an alkali metal or ammonium salt of trinitrobenzoic acid. The reaction is carried out in the presence of a noble metal catalyst, and the product is suitable for conversion in situ to phloroglucinol.

ERRATUM

For Class 260—603 see:
Patent No. 3,678,139

3,678,115

PROCESS FOR PRODUCTION OF SULFUR-CONTAINING PHENOLS

Tamotsu Fujisawa; Mizuo Yamamoto, and Genichi Tsuchihashi, all of Sagamihara, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed April 24, 1970, Ser. No. 31,769

Claims priority, application Japan, April 30, 1969, 44/32756

Int. Cl. C07c *149/38*

U.S. Cl. 260—609 F 9 Claims

A new process for the preparation of 4,4'-thiobis(2,6-di-t-butylphenol) is disclosed. Hindered phenol, 2,6-di-t-butylphenol, is reacted with a sulfur chloride in the absence or presence of a catalytic amount of iron powder or a Lewis acid and the reaction product is then heated with caustic alkali in a solvent. The process yields 4,4'-thiobis(2,6-di-t-butylphenol) economically and in a high yield.

3,678,116

PROCESS FOR PREPARING A METHANO-POLY-CYCLIC HYDROQUINONE

Arthur W. Carlson, Crystal Lake, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed March 18, 1968, Ser. No. 714,023

Int. Cl. C07c *37/00*

U.S. Cl. 260—619 F 9 Claims

A process for preparing a methano-polycyclic hydroquinone which comprises rearranging a corresponding methano-polycyclic quinone under isomerization conditions in the presence of an inert solvent and water and thereafter recovering the desired hydroquinone product.

3,678,117

1,1-BIS(TRIFLUOROMETHYL)-2,2-DIPHENYLETHYLENES HAVING SELECTED SUBSTITUENTS ON PHENYL

William J. Middleton, Chatham, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 31, 1969, Ser. No. 873,124

Int. Cl. C07c *39/12*

U.S. Cl. 260—619 R 2 Claims

Described are certain 1,1-bis(trifluoromethyl)-2,2-diphenylethylenes, which carry an oxy group in the para position of at least one benzene ring. These new compounds, as well as their parent compound, 1,1-bis-(trifluoromethyl)-2,2-diphenylethylene, are effective in preventing pregnancy in warm-blooded animals and can be administered after coitus.

3,678,118

IMPROVED PROCESS FOR PREPARING ETHANOL

Orville D. Frampton, Wyoming, and Julian Feldman, Cincinnati, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Nov. 24, 1967, Ser. No. 685,272

Int. Cl. C07c *29/04*; B01j *11/34*

U.S. Cl. 260—641 8 Claims

Ethanol is prepared by contacting ethylene and liquid water or an aqueous solution of an inert solvent with a catalytic amount of a prereduced catalyst consisting of a blue tungsten oxide on a zirconia support at 250°–350° C., 750–5,000 psi, and a mole ratio of water to ethylene of 5:1 to 25:1.

3,678,119

ACID ISOMERIZATION OF CHAMIGRENES

Garry C. Kitchens, Wayne; Alan R. Hochstetler, Bloomfield, and Kent Kaiser, Pequannock, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Jan. 18, 1971, Ser. No. 107,471

Int. Cl. C07c *13/30*, *13/48*

U.S. Cl. 260—666 PY 4 Claims

α- and β-chamigrenes treated with substantially anhydrous strong acids, suitably in the presence of an alkanoic acid are isomerized to give a mixture of novel tricyclic $C_{15}H_{24}$ olefinic hydrocarbons rich in 6,8a-ethano-1,1,6-trimethyl-1,2,3,5,6,7,8,8a-octahydronaphthalene. The aforementioned compound is useful as an intermediate in the preparation of compounds in perfume compounding.

3,678,120

HYDROCARBON CONVERSION CATALYST AND PROCESS

Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Jan. 29, 1970, Ser. No. 6,954

Int. Cl. C07c *15/02*

U.S. Cl. 260—668 A 14 Claims

A hydrocarbon conversion catalyst comprising an inert support combined with an active catalytic complex comprising either SbF_5—HF or SbF_5—HSO_3F. The catalyst is particularly suitable for isomerization, alkylation and polymerization processes.

3,678,121

PREPARATION OF TELOMERIC LIQUID POLYBUTADIENE OILS

Bobby Joe McElroy, York, S.C., and Joseph Herbert Merkley, Gastonia, N.C., assignors to Lithium Corporation of America, New York, N.Y.

Filed Jan. 22, 1971, Ser. No. 109,002

Int. Cl. C07c *15/02*

U.S. Cl. 260—668 B 24 Claims

Preparation of telomeric liquid polybutadiene oils by the telomerization of 1,3-butadiene with toluene in the presence of a complex of a polylithio hydrocarbon with tetramethylethylenediamine, at a temperature of about 40°–110° C at atmospheric pressure.

3,678,122

ALLYLATION OR BENZYLATION OF AROMATIC COMPOUNDS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 5, 1970, Ser. No. 78,279

Int. Cl. C07c *3/56*

U.S. Cl. 260—671 A 10 Claims

Aromatic compounds may be allylated or benzylated by treatment with an allylic halide or a benzylic halide in the presence of a copper halide catalyst to form allylated substituted aromatic compounds. The reaction is exemplified by the treatment of benzene with allyl chloride in the presence of copper chloride to form allylbenzene.

3,678,123

TERTIARY ALKYLATION UTILIZING AN ADMIXTURE OF OLEFINS AND TERTIARY ALKYL CHLORIDES

Jesse K. Boggs, Houston, Tex., assignor to Esso Research and Engineering Company

Filed Dec. 28, 1970, Ser. No. 102,093

Int. Cl. C07c 3/56

U.S. Cl. 260—671 R 10 Claims

Benzene or naphthalene is selectively tertiary alkylated by reaction with C_7 to C_{44} tertiary alkyl chlorides in admixture with tertiary olefins similar to those from which the tertiary alkyl chlorides are derived, in the presence of a Friedel-Crafts catalyst and under reaction conditions including a temperature from −20° C. to 30° C., a pressure of from 5 to 400 mm Hg. absolute and in the presence of a rapidly boiling liquid.

3,678,124

PROCESS FOR THE PRODUCTION OF MONO- AND DIOLEFIN HYDROCARBONS

Gennady Arkadievich Stepanov, ulitsa Pervomaiskaya, 9, kv. 3; Anatoly Lvovich Tsallingold, Schitovoi poselok, 4-a sektsia, 3, kv. 20; Fedor Semenovich Pilipenko, Volzhskaya naberezhnaya, 25/2, kv. 7, all of Yaroslavl; Valerian Mikhailovich Sobolev, Naberezhnaya M. Gorkogo, 25/2, kv. 7, Moscow; Georgy Konstantinovich Boreskov, ulitsa Zolotodolinskaya, 85, Novosibirsk; Roman Alexeevich Buyanov, ulitsa Zhemchuzhnaya, 8, kv. 27, Novosibirsk, and Sergei Alexeevich Venyaminov, ulitsa Zhemchuzhnaya, 4, kv. 15, Novosibirsk, all of U.S.S.R.

Filed Oct. 24, 1968, Ser. No. 770,409

Int. Cl. C07c 11/22, 5/18, 3/28

U.S. Cl. 260—680 E 6 Claims

A process for the production of mono- and diolefin hydrocarbons by the catalytic oxidative dehydrogenation of paraffin hydrocarbons at 400°–700°C in the presence of catalysts comprising mixed oxide systems and consisting of oxides of molybdenum and/or tungsten and oxides of at least one of the following metals: chromium, manganese, iron, nickel and cadmium.

3,678,125

SILOXANE CONTAINING THERMOPLASTIC

John C. Saam, and Frederick W. G. Fearon, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 25, 1970, Ser. No. 66,892

Int. Cl. C08g 47/10; C08f 33/08

U.S. Cl. 260—827 6 Claims

Block copolymers of polydiorganosiloxane blocks and polystyrene blocks are thermoplastics useful as coating materials and film formers with excellent weathering.

3,678,126

SILOXANE CONTAINING THERMOPLASTIC ELASTOMERS

John C. Saam, and Frederick W. G. Fearon, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 25, 1970, Ser. No. 66,893

Int. Cl. C08g 47/10; C08f 33/08

U.S. Cl. 260—827 7 Claims

Block copolymers of polydiorganosiloxane blocks and polystyrene blocks are thermoplastic elastomers useful as coating materials and film formers with gas permeability.

3,678,127

CARBOXY TERMINATED POLYAMIDES AND DIEPOXIDES

Rolf Schmid, Gelterkinden; Friedrich Lohse, Oberwil Baselland, and Hans Batzer, Ariesheim, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

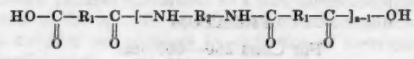
Continuation-in-part of Ser. No. 756,354, Aug. 30, 1968, Pat. No. 3,558,742. This application Oct. 19, 1970, Ser. No. 82,073

Claims priority, application Switzerland, Sept. 11, 1967, 12701/67

Int. Cl. C08g 45/12

U.S. Cl. 260—830 P 9 Claims

A curable composition which can be converted into crystalline plastics at an elevated temperature, characterized in that it contains long-chain polyamide-dicarboxylic acids of the formula



in which R_1 and R_2 each are members selected from the group consisting of branched alkylene, linear alkylene, branched alkenylene and linear alkenylene residue, and a is an integer of at least 2, preferably 2 – 10, as well as diepoxy compounds and, if desired, also antioxidants, and in which for every epoxide group equivalent 0.7 to 1.2, preferably 0.9 to 1.1 equivalent of carboxyl groups is present.

3,678,128

COATING COMPOSITIONS COMPRISING A MIXTURE OF A POLYESTER AND AN AMINOPLAST

Franz Riemhofer; Walter Dittman; Uwe Biethan; Karl-Heinz Hornung, and Ernst-Christian Schultze, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed Oct. 23, 1969, Ser. No. 868,895

Claims priority, application Germany, Oct. 25, 1968, P 18 05 186.0; Oct. 25, 1968, P 18 05 185.9; Oct. 25, 1968, P 18 05 182.6

Int. Cl. C08g 37/34

U.S. Cl. 260—850 8 Claims

Coating compositions resistant to yellowing, solvents, acids and alkalies and having the combination of high elasticity and good hardness are produced by using a mixture of

a. an aminoplast and

b. a polyester having an average molecular weight of 400–4,000 of (I) a diol mixture which includes one or both of ethylene glycol and 1,2-propanediol, and (II) an acid mixture which consists essentially of 91–33 percent of a cyclic dicarboxylic acid and 9–67 percent of an acyclic dicarboxylic acid.

3,678,129

THERMOPLASTIC POLYMER BLENDS CONTAINING POLYVINYL CHLORIDE, POLYETHER URETHANE AND BUTADIENE-ACRYLONITRILE COPOLYMERS

William K. Fischer, Woodbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed June 22, 1970, Ser. No. 48,163

Int. Cl. C08g 41/04

U.S. Cl. 260—859 PV 12 Claims

Thermoplastic blends comprising a polyvinyl halide resin, a polyether polyurethane elastoplastic and an uncured diene-nitrile rubber in specified quantities and having specified properties have utility for various end used, those blends having excellent abrasion resistance being particularly suitable for use as shoe heel lift compositions.

3,678,130

ADHESIVE COMPOSITIONS CONTAINING EPOXY RESIN, CARBOXY CONTAINING COPOLYMER AND 1,5-DIHYDROZYNAPHTHALENE

David K. Klapprott, and Daniel L. Paradis, both of Concord, Calif., assignors to The Dexter Corporation, Pittsburg, Calif.

Filed Sept. 10, 1970, Ser. No. 71,270
Int. Cl. C08g 45/04
U.S. Cl. 260—837 R 15 Claims

The disclosure describes new adhesive compositions having improved toughness and excellent high temperature shear strength comprising the reaction product of a major amount of a polyepoxide with a minor amount of a reactive carboxyl group containing polymer and 1,5-dihydroxynaphthalene.

3,678,131

ADHESIVE COMPOSITIONS CONTAINING EPOXY RESIN, CARBOXYL CONTAINING COPOLYMER AND 2,2,-BIS-(4-HYDROXYPHENYL) SULFONE

David K. Klapprott, and Daniel L. Paradis, both of Concord, Calif., assignors to The Dexter Corporation, Pittsburg, Calif.

Filed Sept. 10, 1970, Ser. No. 71,269
Int. Cl. C08g 45/04
U.S. Cl. 260—837 R 15 Claims

The disclosure describes new adhesive compositions having improved toughness and excellent high temperature shear strength comprising the reaction product of a major amount of a polyepoxide with a minor amount of a reactive carboxyl group containing polymer and 2,2-bis(4-hydroxyphenyl)sulfone.

3,678,132

VINYL CHLORIDE RESIN BLENDS

Masataka Isogawa, Osaka; Shoichi Minato, and Zenjiro Ando, both of Kobe, all of Japan, assignors to Kanegafuchi Kogaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 25, 1970, Ser. No. 14,181
Claims priority, application Japan, March 4, 1969, 44/16344
Int. Cl. C08f 29/24, 37/18
U.S. Cl. 260—876 R 8 Claims

Thermoplastic resinous compositions comprising a blend of (1) 20 to 60 percent by weight of vinyl chloride resin and (2) 80 to 40 percent by weight of (A) 40 to 80 percent by weight of a resin prepared by copolymerizing 30 to 80 percent by weight of alpha methylstyrene, 5 to 50 percent by weight of methyl methacrylate, and 3 to 30 percent by weight of acrylonitrile; and (B) 60 to 20 percent by weight of a graft copolymer prepared by graft copolymerization of 65 to 35 percent by weight butadienic polymer and 35 to 65 percent by weight of a monomer mixture of 50 to 80 percent by weight of styrene, 20 to 50 percent by weight of methyl methacrylate, and 0 to 30 percent by weight of acrylonitrile.

3,678,133

MODIFIED VINYL HALIDE POLYMERS

Charles Francis Ryan, Warminster, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed April 24, 1970, Ser. No. 31,754
Int. Cl. C08f 37/18, 41/12
U.S. Cl. 260—876 R 24 Claims

Superior impact modified vinyl halide polymers with exceptional low die swell characteristics are attained by a modifier composition which does not contribute to the instability of the vinyl halide polymers. The modified polymers are readily extrudable, even into complex and delicate shapes, at moderate conditions and in simple equipment. The modifier composition is a multiphase acrylic composite interpolymer having a first cross-linked acrylic elastomer phase, and a second, acrylic ridig thermoplastic phase polymerized onto the elastomer, having a molecular weight in the range of from about 50,000 to 600,000.

3,678,134

BLEND OF ETHYLENE-BUTENE COPOLYMER WITH BUTADIENE-STYRENE RADIAL BLOCK COPOLYMER

Terence C. Middlebrook, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed March 8, 1971, Ser. No. 122,238
Int. Cl. C08f 29/12
U.S. Cl. 260—876 B 4 Claims

Cured blends of ethylene, 1-butene copolymer with a radial block copolymer of butadiene and styrene in critical amounts have a higher tensile strength than either the ethylene, 1-butene copolymer or the radial block copolymer. A process is provided for producing such blends.

3,678,135

CO-CURE OF BLEND OF RUBBER OF LOW UNSATURATION AND HIGHLY UNSATURATED RUBBER USING LONG CHAIN HYDROCARBON DITHIOCARBAMATE ACCELERATORS

Richard Mastromatteo, Woodbury, and Thomas J. Brett, Jr., Cheshire, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Sept. 9, 1970, Ser. No. 70,936
Int. Cl. C08f 29/12
U.S. Cl. 260—889 23 Claims

Use of such long chain hydrocarbon dithiocarbamate accelerators as zinc N-dodecyl, N-isopropyl dithiocarbamate in the sulfur cure of blends of rubber of low unsaturation, particularly EPDM, with highly unsaturated rubbers such as SBR, NBR, etc., produces vulcanizates having high tensile strength.

3,678,136

FLAME RETARDANT POLYOLEFINS

Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed June 24, 1970, Ser. No. 49,560
Int. Cl. C08f 29/12
U.S. Cl. 260—897 C 4 Claims

Polyolefins are rendered flame retardant by the addition of a small amount of a polymer of epibromohydrin having an RSV of at least about 0.08. Preferably, the flame retardant polyolefins contain at least about 10% of the polymer of epibromohydrin when it is the sole flame retardant or at least about 4% of the polymer combined with from about 1 to 15% of an antimony compound.

3,678,137

ADAMANTYL-SUBSTITUTED-ALKYL 2-AMINOETHYL PHOSPHATES AND PHOSPHONATES

Francis R. Pfeiffer, Cinnaminson, and Jerry A. Weisbach, Cherry Hill, both of N.J., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed Oct. 15, 1970, Ser. No. 81,109
Int. Cl. C07f 9/08, 9/28; A61k 27/00
U.S. Cl. 260—944 9 Claims

Adamantoyl, adamantyl or adamantylalkyl-oxyalkyl 2-aminoethyl phosphates and phosphonates having renin inhibitory activity.

3,678,138

SOLID PROPELLANT CHARGE MAKING IN MOLD HAVING PERFORATED SEPARATOR MEANS

Stuart Gordon, Cleobury Mortimer; Geoffrey Ian Evans, Bewdley, and Alwyn Cunliffe, Kidderminster, all of England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed March 30, 1970, Ser. No. 23,724
Claims priority, application Great Britain, April 3, 1969, 17,482/69
Int. Cl. C06b 21/02
U.S. Cl. 264—3 R 10 Claims

A method of casting a plurality of solid propellant charges

comprising locating in a mould cavity a plurality of quantities of casting powder spaced apart by separator members, compressing the casting powder, displacing air from the casting powder by a casting liquid and curing the propellant charges formed from the quantities of casting powder.

3,678,139

CONVERSION OF METHANOL TO FORMALDEHYDE USING A BISMUTH MOLYBDATE ON SILICA CATALYST

William R. McClellan, Kennett Square, Pa., and Alvin B. Stiles, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 707,909, Feb. 2, 1968, which is a continuation-in-part of Ser. No. 614,485, Feb. 7, 1967, abandoned. This application Nov. 24, 1969, Ser. No. 879,554

Int. Cl. C07c 45/16

U.S. Cl. 260—603 HF 1 Claim

A two-step process for the vapor phase conversion of methanol with oxygen to formaldehyde uses a conventional silver catalyst in the first step and an improved bismuth molybdate on silica catalyst in the second at temperatures between 450° and 600° C. The improved catalyst is made by mixing compounds to produce bismuth oxide, molybdenum oxide and, optionally, phosphorus oxide, in an aqueous slurry in the desired proportions, adding the slurry to an aqueous silica sol and then adding to the slurry ammonium carbonate or ammonium bicarbonate until the pH is in the range of 5 to 7.5, subsequently drying and calcining at 400° to 550° C. to produce the desired catalyst.

3,678,140

PROCESS FOR FOAMING AQUEOUS PROTEIN-CONTAINING BLASTING AGENTS

Philip E. Adams, Falling Waters, W. Va., and Philip W. Fearnow, Hagerstown, Md., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 3, 1969, Ser. No. 881,771

Int. Cl. C06b 21/02

U.S. Cl. 149—109 6 Claims

Passing a thickened protein-containing water-bearing blasting agent through a plurality of orifices at a pressure of about 40 to 160 psi to create a vacuum in the area where the blasting agent exits from the orifice, incorporating air or other gas in the blasting agent and, thereafter, reducing the velocity of the blasting agent to provide a foamed product.

3,678,141

PROCESS FOR COLORING EPOXY PLASTIC EYEGLASS FRAMES AND PARTS THEREOF

Richard T. Metcalfe, Sturbridge, Mass., and Harry D. Crandon, Wootstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.

Filed April 16, 1969, Ser. No. 816,822

Int. Cl. B29c 9/00, 25/00; C08g 51/04

U.S. Cl. 264—22 1 Claim

A process for coloring epoxy plastic resins for eyeglass frames and parts thereof adds dyes or pigments to one or more of the liquid resin precursors or the liquid hardeners immediately prior to casting. Variegated patterns and other color effects may be made by metering two or more colors together with the resin precursors at the casting operation. Translucent colors are made by using solvent soluble dyes added to the resin precursors, opaque colors may be made by adding pigments to the precursors, and demi-shades are made by bleaching the dye cured resin at certain areas of the frames by exposure by heat or ultraviolet radiation.

3,678,142

PROCESS FOR PERMANENTLY CRIMPING YARN AND THE LIKE

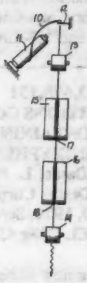
Paul Dubach, Hochhaus II, Wattwil, Switzerland

Continuation of Ser. No. 714,746, March 20, 1968, abandoned. This application June 25, 1970, Ser. No. 56,058

Claims priority, application Switzerland, March 28, 1967, 4319/67

Int. Cl. D02g 1/00

U.S. Cl. 264—25 12 Claims



The beam from a laser is caused to traverse either continuously or periodically along the length of a filament, thread, yarn, ribbon, or the like, while the same is under tension. The arrangement is such as to develop a temperature gradient through the element in a transverse direction relative to its longitudinal axis, wherever the laser beam impinges, for developing differential relaxation of stresses therein and to impart a crimp thereto.

3,678,143

USE OF REFRACTORY PARTING LAYER TO AID SKULL REMOVAL FROM FURNACE LININGS

Mark E. Harnish, and Merrit A. Peters, both of Plymouth Meeting, Pa., assignors to International Minerals & Chemical Corporation

Filed Nov. 25, 1970, Ser. No. 92,870

Int. Cl. F27d 1/16; C04b 35/12

U.S. Cl. 264—30 12 Claims

Refractory linings of metallurgical vessels, such as a tundish lined with alumina brick, are protected from the destructive effects of molten metal, skull, and skull removal by applying a coating of special refractory parting composition to the metal-contacting interior surfaces of the refractory lining. The coating is applied after skull removal and prior to returning the vessel to service. The special refractory parting composition consisting of a mixture of chrome ore, periclase, and a magnesium salt, and the particle size distribution are compounded to adhere to the solidified metal of the skull, to be non-adherent to the refractory lining, and to crumble on skull removal to the extent necessary to prevent injury to the refractory lining.

3,678,144

SILICATE BODIES CONTAINING COPRECIPITATED OXIDES

Robert D. Shoup, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed June 12, 1970, Ser. No. 45,906

Int. Cl. B29h 7/20

U.S. Cl. 264—42 7 Claims

This invention relates to the discovery of a method for incorporating various oxides into silica-containing porous and nonporous glass materials by dissolving soluble compounds of the additive oxides, characterized as M_xO_y, into solutions, colloidal solutions, or suspensions of soluble silicates, reacting the mixture with an organic compound, and then firing the

thus-formed body at temperatures below the softening point of the particular glass composition for a sufficient length of time to produce the porous body or non-porous glass body containing the added oxides intimately bonded to the silica network.

3,678,145
METHOD FOR PREPARING METAL MATRIX COMPOSITES CONTAINING MODIFIED POLYTETRAFLUOROETHYLENE

David J. Boes, Monroeville, Pa., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Dec. 23, 1969, Ser. No. 887,730
Int. Cl. C08f 3/24; C10m 5/10; F16d 69/00
U.S. Cl. 264—115 **2 Claims**

Polytetrafluoroethylene, sold under the trademark Teflon, is modified before being blended with metal powder and formed into a composite. Modification is accomplished by heating the Teflon for 1 to 2 hours at 1,000°–1,100°F and then for 3 to 3.5 hours at 650° to 750°F. Metal matrix composites containing modified Teflon as a filler are useful as retainer materials for bearings which are subjected to high temperature operating conditions.

3,678,146
PROCESS FOR MAKING PIPE BENDS OF THERMOPLASTIC MATERIAL

Emil Rottner; Franz Bock; Willi Muth, and Gunter Wenzel, all of c/o Farbwerke Hoechst AG, Frankfurt am Main, Germany

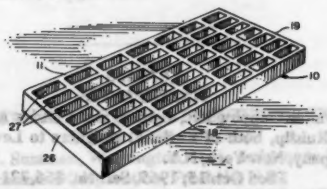
Division of Ser. No. 775,443, Nov. 13, 1968, Pat. No. 3,562,860. This application April 30, 1970, Ser. No. 43,633
Claims priority, application Germany, Nov. 29, 1967, P 17 04 661.6
Int. Cl. B29c 1/12; B29d 23/10
U.S. Cl. 264—313 **2 Claims**

Pipe bends of thermoplastic material are manufactured by thermoforming by shoving a sleeve-shaped pipe section which is closed at one end into a pipe bend mold which is symmetrically split in the longitudinal direction. The introduction is carried out with the help of a flexible core which is several times split longitudinally and which is pressed against the bottom of the pipe section. After cooling, the mold is opened and the core or its individual parts are pulled out of the pipe bend and the ends of the latter are trimmed.

3,678,147
METHOD FOR MAKING REINFORCED GRATING

Lee H. Patchen, Drawer G, Knoxville, Ark.

Filed April 13, 1970, Ser. No. 27,725
Int. Cl. B29c 11/00
U.S. Cl. 264—325 **6 Claims**

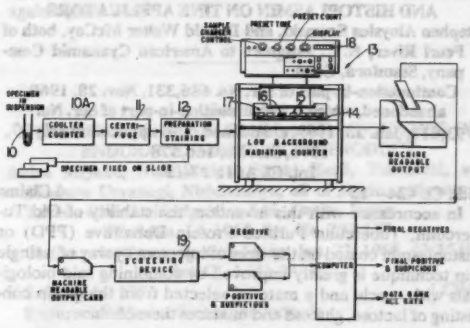


A method of forming a plastic grating reinforced with longitudinally and transversely extending rows of strands or filaments, each of the rows of filaments comprising a plurality of spaced-apart generally aligned filaments. The openings of the grating are provided through the areas defined by intersecting rows of filaments. The grating is formed by introducing a predetermined amount of resin material into a pan mold, and then lowering a lattice of intersecting rows of filaments into the mold. Thereafter, a mold core which includes vertically extending fingers shaped to be received by the vertically extending openings in the lattice is lowered into the mold to raise the level of the resin material to cover the filaments. After the resin material is hardened, the mold core is raised and the grating is removed from the pan mold.

3,678,148
RADIOACTIVE SLIDE SPECIMEN ANALYSIS OF AND METHOD OF PREPARATION

Leonard Caiola, Ridgewood, N.J., assignor to Information Utilization Corporation, New York, N.Y.

Filed June 26, 1969, Ser. No. 836,768
Int. Cl. A61k 27/04; G21h 5/02
U.S. Cl. 424—1 **9 Claims**



A slide specimen of exfoliated cells is prepared in the usual manner for microscopic optical examination of a Papanicolaou Test, up to the point of staining. At this stage, instead of the ordinary stains, a stain containing a radioisotope is used. The slide with the radioisotope-bearing stain is thereupon passed through a radiation counter which gives an indication of the amount of radiation the slide emits, which indicates the amount of radioactive stain absorbed by the specimen. This relative absorption amount indicates the differential staining of the cellular material and forms the equivalent electronic differentiation of the specimens to the standard Papanicolaou optical differentiation as viewed through the microscope. In this way, the automatic radiation counter is used to substitute for the human element in the microscopic evaluation of the specimens.

3,678,149
METHOD OF ENHANCING THE ACTION OF A MEDICAMENT

Samuel J. Prigal, 225 West 106th St., New York, N.Y.

Continuation-in-part of Ser. No. 490,642, Sept. 27, 1965, Pat. No. 3,492,399, which is a continuation-in-part of Ser. Nos. 170,242, Jan. 31, 1962, abandoned, and Ser. No. 401,669, Oct. 6, 1964, abandoned, which is a continuation-in-part of Ser. No. 47,364, Aug. 4, 1960, abandoned, and Ser. No. 28,011, May 10, 1960, Pat. No. 3,096,249. This application Jan. 26, 1970, Ser. No. 5,950
Int. Cl. A61k 27/12
U.S. Cl. 424—8 **6 Claims**

This invention is concerned with a method of prolonging the action of a medicament in a mammal by administering parenterally thereto an emulsion comprising an aqueous phase dispersed substantially uniformly throughout a metabolizable vegetable, animal or hydrocarbon oil containing one or more hydrocarbons of about 12 to 18 carbon atoms, the aqueous phase having an average particle size of about 0.1 to 10 microns and including an effective dose of a medicament. The medicament may be therapeutic or prophylactic in nature, and more specifically, may include live or killed microorganisms, pollen extract and a host of other materials.

In another aspect of the invention non-specific resistance of the mammal is induced by administering parenterally the aforedescribed emulsion in which the medicament is a lipopolysaccharide and such an emulsion induces in the mammal resistance to radiation, shock and infection when subjected thereto. In a specific sense the fetus of a mammal may derive higher resistance to infection or radiation by administration to the female mammal the aforedescribed emulsion.

The oil phase of the emulsion decreases the LD_{50} of a toxic medicament.

The mammals in which such responses can be achieved are mice, rabbits, monkeys, rats, guinea pigs, pigs, dogs, and the like.

3,678,150

PROCESS FOR IMPROVING THE STABILITY OF PPD, QT AND HISTOPLASMIN ON TINE APPLICATORS

Stephen Aloysius Szumski, and Donald Walter McCoy, both of Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 686,331, Nov. 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 793,611, Jan. 23, 1969, abandoned. This application July 27, 1971, Ser. No. 166,578

Int. Cl. A61k *27/12*

U.S. Cl. 424—12 4 Claims

In accordance with this invention, the stability of Old Tuberculin, Tuberculin Purified Protein Derivative (PPD) or histoplasmin coated on the tines of injectors by way of a single dip technique is greatly improved by combining said biologicals with acacia and a material selected from the group consisting of lactose, glucose and mixtures thereof.

3,678,151

BIOLOGICAL STAINING METHOD

Andrew Horonick, and Andre V. Munschy, both of Bronx, N.Y., assignors to Gugol-Clini-Tex, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 562,487, July 5, 1966, abandoned. This application July 25, 1969, Ser. No. 845,089

Int. Cl. G01n *1/30, 33/16*

U.S. Cl. 424—3 2 Claims

The invention relates to preparation of precise micro and other values of volumetric concentrations of chemicals, standards, reagents, pharmaceuticals and biologicals in solvents therefor and utilizes dry segments from an inert, integrally divisible and absorbent carrier uniformly impregnated with said substances, each of the segments carrying a computed quantity of the impregnation based on the proportionate size with respect to the carrier. One of the objects of the invention is in the preparation and utilization of segments as dry stain or dye strips for formation of liquid stains applicable to biological materials such as blood smears and bacteria for staining and microscopic examination purposes.

3,678,152

METHOD FOR THE X-RAY VISUALIZATION OF BODY CAVITIES AND A PREPARATION FOR CARRYING OUT THE METHOD

Lars Bjork, Dobelnsgatan 22D; Uno Eugen Erikson, Robertsuagen 8, and Bjorn Gustov-Adolf Ingelman, Ovre Slottsgatan 1D, all of Uppsala, Sweden

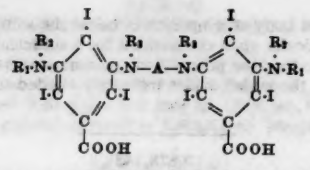
Division of Ser. No. 689,724, Dec. 11, 1967, abandoned. This application Oct. 6, 1969, Ser. No. 864,167

Claims priority, application Sweden, Dec. 13, 1966, 17053/66

Int. Cl. A61k *27/08*

U.S. Cl. 424—5 24 Claims

Compositions which comprise at least one iodine compound of the formula:



wherein R_1 is a lower alkyl group having no more than five carbon atoms and R_2 and R_3 are each a lower acyl group having no more than five carbon atoms and wherein A is an alkylene group substituted by at least one substituent of the formula $—OR_4$ wherein R_4 is a member selected from the group consisting of hydrogen, lower alkyl and lower acyl, said alkyl and acyl having each no more than five carbon atoms; said alkylene containing from three to 15 inclusive carbon atoms and optionally being broken by one or more oxygen bridges or a physiologically acceptable salt thereof. Such compositions are useful as X-ray contrast compositions and are administered to the body of the test object for the X-ray visualization of body cavities.

3,678,153

DIFLUOROXALATOSTANNATE(II) COMPLEXES

Simon Katz, Indianapolis, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Filed Jan. 20, 1971, Ser. No. 108,227

Int. Cl. A61k *7/16*

U.S. Cl. 424—52 19 Claims

A new genus of compositions of matter, namely, difluoroxalatostannate(II) complexes has been discovered. These compounds when incorporated into oral compositions for dental caries prophylaxis (e.g., as a constituent of a dentifrice, prophylaxis paste, or mouthwash), have demonstrated substantial utility as an anticariogenic agent.

3,678,154

ORAL COMPOSITIONS FOR CALCULUS RETARDATION

James S. Widder, and William W. Briner, both of Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed July 1, 1968, Ser. No. 741,264

Int. Cl. A61r *7/16*

U.S. Cl. 424—52 13 Claims

Oral compositions, such as toothpaste, mouthwash, and the like, containing certain polyphosphonates as anticalculus agents, and a water-soluble source of fluoride ions to counteract the adverse effects of such polyphosphonates on post eruptive maturation of dental enamel.

3,678,155

TOOTHPASTES

John Walter Clippingdale, Egham, and Charles Andrew Watson, Ruislip, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Oct. 15, 1969, Ser. No. 866,721

Claims priority, application Great Britain, Oct. 29, 1968, 51286

Int. Cl. A61k *7/16*

U.S. Cl. 424—52 8 Claims

Using milled alpha-alumina trihydrate as a toothpaste abrasive can sometimes give rise to corrosion of unlacquered aluminum tubes accompanied by the production of hydrogen gas. This can be prevented by including in the toothpaste a source of monofluorophosphate ions.

3,678,156

COMPOSITIONS FOR TOPICAL APPLICATION TO ANIMAL TISSUE AND METHOD OF ENHANCING PENETRATION THEREOF

Francis S. Kilmer MacMillan, and Warren I. Lyness, both of Cincinnati, Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 595,437, Nov. 18, 1966, Pat. No. 3,527,864, which is a continuation-in-part of Ser. No. 344,195, Feb. 12, 1964, abandoned. This application May 15, 1970, Ser. No. 48,655

Int. Cl. A61k *7/00, 27/10*

U.S. Cl. 424—68 3 Claims

Antiperspirant composition for topical application to animal tissue comprising an astringent metal salt and from 0.1 to 10 percent by weight of a higher ($C_8 - C_{12}$) aliphatic sulfoxide, said composition having enhanced penetration of the antiperspirant through keratinized epithelial tissue.

3,678,157

HAIR TREATMENT COMPOSITIONS CONTAINING POLYCONDENSABLE COMPOUNDS

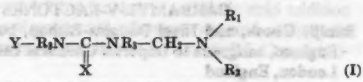
Gregoire Kalopissis, Paris; Jean-Louis Abegg, Le Perreux; Guiliana Ghilardi, and Henri Philippe De Beaulieu, both of Paris, all of France, assignors to Societe anonyme dite: L'Oreal

Filed Oct. 23, 1968, Ser. No. 770,074

Int. Cl. A61k *7/10*

U.S. Cl. 424—71 4 Claims

A composition for treating hair containing a cosmetically effective amount of a polycondensable compound having the formula:



(I)

in which:

Y is selected from the group consisting of H, hydrocarbon chains comprising one to 30 carbon atoms, groups consisting of cosmetic constituents which have —S—S, —SH, —COOH, basic quaternary ammonium, and fatty chain groups,

X is selected from the group consisting of O, S and NH,

R_1 and R_2 are selected from the group consisting of lower alkyl and together may form a heterocyclic group, comprising nitrogen and/or oxygen atoms,

R_3 is selected from the group consisting of H, alkyl, and the two R_3 groups may form a heterocyclic group, comprising nitrogen and/or oxygen atoms.

3,678,158

TREATMENT OF HERNIATED INTERVERTEBRAL DISCS OF MAMMALS

Bernard J. Sussman, Washington, D.C., assignor to Worthington Biochemical Corporation, Freehold, N.J.

Continuation-in-part of Ser. No. 729,436, May 15, 1968, abandoned. This application May 11, 1971, Ser. No. 142,333

Int. Cl. A61k *19/00*

U.S. Cl. 424—94 2 Claims

Herniated intervertebral discs of mammals are treated to effect the selective in situ dissolution in vivo of nucleus pulposus and fibrocartilaginous tissue by the use of a sterile solution of purified collagenase injected into the intervertebral disc space.

3,678,159

ANTIBIOTICS OBTAINED FROM STREPTOMYCES MIHARAENSIS

Taro Nilda; Hiroshi Yumoto; Takashi Tsuruoka, all of Kanagawa-ken; Kazuko Hamamoto, Tokyo; Jakashi Shomura, Kanagawa-ken, and Takawo Ohashi, Tokyo, all of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 626,470, March 28, 1967. This application Dec. 24, 1968, Ser. No. 791,856

Claims priority, application Japan, March 28, 1966, 41/18691

Int. Cl. A61k *21/00;* C12b *1/00*

U.S. Cl. 424—116 5 Claims

Miharamycin A and miharamycin B, obtained by cultivating selected strains of actinomyces (*Streptomyces miharaensis*), have a strong inhibition activity against microbes of rice blight and those of Pseudomonas and exhibit an effective activity against plant virus.

3,678,160

HYDROXYETHANE SULFONIC ACID DERIVATIVE OF ENDURACIDIN REDUCTION PRODUCT

Akira Miyake, Nishinomiya; Stoshi Horii, Takatsuki, and Jisaburo Ueyanagi, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 14, 1969, Ser. No. 791,127

Claims priority, application Japan, Jan. 22, 1968, 43/3639

Int. Cl. A61k *21/00*

U.S. Cl. 424—117 1 Claim

Enduracidin derivatives of the formula

$$En\cdot(NH_2)_r(NH_m\cdot X_l(CH_2)_n—SO_3M)_p$$

wherein En is Enduracidin residue, *r* is 0. 1 or 2, *p* is 1, 2 or 3 and *r* plus *p* is 3, X is a member selected from the group consisting of hydroxyl, amino radical and a radical represented by the formula: —SO_3M, wherein M is hydrogen or alkali metal, *n* is 1, 2 or 3, *m* is 1 or 2, and *l* is 0 or 1, and when *n* is 1, *m* represents 1, *l* represents 0 and X represents hydroxyl radical, and when *n* is 2 or 3, *m* represents 2 and *l* represents 1, have improved stability and therapeutic activity of Enduracidin itself.

3,678,161

GANGTOKMYCIN AND PRODUCTION THEREOF BY STREPTOMYCES GANGTOKENSIS

Motoo Shibata, Toyonaka; Hiroichi Yamamoto, Kobe; Eiji Higashide, Takarazuka; Komei Mizuno, Osaka; Mashiko Imanishi, Takarazuka, and Akira Miyake, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 20, 1964, Ser. No. 405,134

Claims priority, application Japan, Oct. 24, 1963, 38/56946

Int. Cl. A61k *21/00*

U.S. Cl. 424—122 2 Claims

Gangtokmycin, produced by culturing *Streptomyces gangtokensis* No. 69249 (ATCC-15665) under aerobic conditions, shows antimicrobial activity against gram-positive bacteria and antifungal activity against phytopathogenic fungi. It is useful in treating candidosis, Cryptococcus diseases, athlete's foot, etc. and also as an agricultural chemical for Helminthosporium leaf spot, late blight, smut, etc. without phytotoxicity.

3,678,162

INHIBITING OR PREVENTING THROMBUS FORMATION WITH 2-METHYLTHIOADENOSINE-5'-MONOPHOSPHATE

Mary H. Maguire; Geoffrey R. Gough, both of Mosman, and Frank Michal, Lane Cove, New South Wales, all of Australia, assignors to The University of Sydney, Sydney, New South Wales, Australia

Filed Dec. 8, 1969, Ser. No. 883,354
Claims priority, application Australia, Dec. 13, 1968, 47789
Int. Cl. A61k 27/00
U.S. Cl. 424—180 4 Claims

2-Methylthioadenosine-5'-monophosphate and the ammonium, sodium and potassium salts thereof and pharmaceutical compositions and methods of inhibiting or preventing thrombus formation with these compounds.

3,678,163

STABILIZED AQUEOUS SUSPENSION OF CALCIUM (-) (CIS-1,2-EPOXYPROPYL)-PHOSPHONATE

Donald J. Allen, Gwynedd, and Joseph L. O'Neill, Lafayette Hill, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed June 2, 1969, Ser. No. 829,785
Int. Cl. A61u 27/00
U.S. Cl. 424—203 1 Claim

Stabilized aqueous suspensions of calcium (-) (cis-1,2-epoxypropyl)-phosphonate.

3,678,164

COMPOSITIONS FOR INHIBITING ANOMALOUS DEPOSITION AND MOBILIZATION OF CALCIUM PHOSPHATE IN ANIMAL TISSUE

Marion D. Francis, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 709,871, March 4, 1968, abandoned. This application Feb. 12, 1969, Ser. No. 798,807
Int. Cl. A61k 27/00
U.S. Cl. 424—204 12 Claims

Compositions for inhibiting anomalous deposition and mobilization of calcium phosphates in animal tissue, comprising an effective amount of certain tris(phosphonoalkyl)amines as herein defined, and a pharmaceutical carrier; and a method for treating or preventing conditions involving pathological calcification and hard tissue demineralization in an animal comprising administering to such animal said compositions.

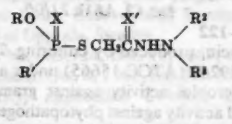
3,678,165

PESTICIDAL PHOSPHORO AND PHOSPHONO ACETYLHYDRAZIDES

Ralph B. Fearing, Bardonia, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 629,401, April 10, 1967, Pat. No. 3,518,327, which is a continuation-in-part of Ser. No. 423,356 Jan. 4, 1965. This application March 19, 1970, Ser. No. 24,976
Int. Cl. A01n 9/36
U.S. Cl. 424—211 5 Claims

This invention is for novel pesticides having the general formula



wherein R is lower alkyl; R' is lower alkyl or lower alkoxy; the radicals represented by X are independently selected from the group consisting of oxygen and sulfur; R^2 and R^3 are independently selected from the group consisting of hydrogen, methyl, ethyl, formyl, acetyl, and in combination can be selected from the group consisting of ethylidene and methylene. The lower alkyl radicals suitable for R and R' are the straight and branched chain aliphatic radicals having from one to eight carbons, and include for example, methyl, ethyl, n-propyl, isopropyl, amyl, octyl, and the like. Similarly the lower alkoxy radicals suitable for R' are the straight and branched chain radicals having from one to eight carbons and include methoxy, ethoxy, n-propoxy, isopropoxy, amoxy, octoxy and the like. Particularly effective as pesticides in the control of insects such as *M. domestica*, *B. germanica*, and *O. fasciatus*. They are also effective in the control of acarids, such as *Tetranychus telarius*, both contact and systemic.

3,678,166

THE TREATMENT OF INFLAMMATION WITH 1,2,3-BENZOTRIAZIN-4(3H)-ONES

Faizulla G. Kathawala, West Orange, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Filed March 15, 1971, Ser. No. 124,488
Int. Cl. A61k 27/00
U.S. Cl. 424—246 6 Claims

The disclosure relates to compounds of the class of 1,2,3-benzotriazin-4(3H)-ones which may be unsubstituted or substituted at the 6,7 and/or 8- positions, e.g. 6-chloro-1,2,3-benzotriazin-4(3H)-one, and their use as anti-inflammatory agents. The compounds may be prepared by reaction of an anthranil amide with sodium nitrite and a strong inorganic acid, e.g. sulfuric acid.

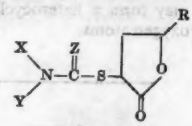
3,678,167

FUNGICIDAL COMPOSITION CONTAINING THIO-CARBAMYL-V-LACTONES

Ranjit Ghosh, and Nigel Douglas Bishop, both of Bracknell, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 526,380, Feb. 10, 1966, Pat. No. 3,464,986. This application March 28, 1969, Ser. No. 832,526
Claims priority, application Great Britain, Feb. 18, 1965, 7,085/65
Int. Cl. A01n 9/12, 9/22, 9/28
U.S. Cl. 424—248 2 Claims

A fungicidal composition comprising a fungicidally effective amount of a compound having the formula:



wherein R stands for hydrogen or lower alkyl, Z stands for oxygen or sulphur, X and Y each stand for hydrogen or alkyl of up to 12 carbon atoms or together with the adjacent nitrogen atom represent a hexamethylenimino, morpholino, or piperidino ring or wherein X stands for a hydrogen atom and Y stands for allyl, chlorophenyl, phenyl-substituted alkyl containing one to two carbon atoms, phenyl, morpholino, dialkylamino containing up to 3 carbon atoms in each alkyl group,

ethoxycarbonylmethyl, tetrahydropyran-2-yl methyl, or 5-methyl-2-oxo-3-thiocarbamylthio-tetrahydrofuran-ethylene, R being alkyl when Y is alkyl, in admixture with a diluent for said compound. These compositions are useful for the control of blast on rice (Piricularia oryzae), rust on wheat (Puccinia triticina) and sore skin on cotton (Rhizoctonia solani).

3,678,168

NITROALKYL-PIPERAZINES FOR INHIBITING BACTERIA FUNGI AND NEMATODES

Nathaniel Grier, Englewood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 457,802, May 21, 1965, Pat. No. 3,399,199. This application June 21, 1968, Ser. No. 738,843

Int. Cl. A01n 9/22

U.S. Cl. 424—250 **4 Claims**

Antimicrobial compositions containing piperazine nitroalkanes useful as soil sterilants and algicides, etc., for agricultural and industrial application.

3,678,169

PYRIDYL-2-IMIDAZOLONES AS ANTI-INFLAMMATORY AGENTS

Norbert Gruenfeld, Bronx, and Enos C. Pesterfield, Jr., Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation

Division of Ser. No. 803,458, Feb. 28, 1969, Pat. No. 3,538,104. This application Jan. 19, 1970, Ser. No. 8,142

Int. Cl. A61k 27/00

U.S. Cl. 424—263 **5 Claims**

Substituted pyridyl-2-imidazolones and their acid addition salts which are analgesic, anti-inflammatory, and antipyretic agents. An illustrative embodiment is 1-methyl-5-(2-pyridyl)-2-imidazolone.

3,678,170

PHARMACEUTICAL METHOD AND COMPOSITIONS EMPLOYING SUBSTITUTED CHROMANONE OXIMES AND CHROMANONE OXIME ETHERS

Robert D. Irsay, Cambridge, Mass., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 786,443, Dec. 23, 1968, Pat. No. 3,510,497, which is a continuation-in-part of Ser. No. 734,549, June 5, 1968, abandoned, which is a continuation-in-part of Ser. No. 580,606, Sept. 20, 1966, abandoned. This application March 26, 1970, Ser. No. 23,016

Int. Cl. A61k 27/00

U.S. Cl. 424—283 **18 Claims**

This disclosure teaches the preparation of chromanone oximes, such as, 7,8-dichloro-4-chormanone oxime and their use as diuretics in warm-blooded mammals.

3,678,171

IRRITANT COMPOSITION COMPRISING CERTAIN CYCLOHEXYLCARBAMATES

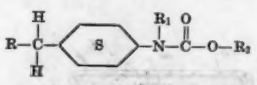
Richard N. Knowles, Hockessin, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 635,302, April 20, 1967, which is a continuation-in-part of Ser. No. 574,495, Aug. 18, 1966. This application Oct. 24, 1968, Ser. No. 770,449

Int. Cl. A01n 9/20

U.S. Cl. 424—300 **9 Claims**

Repelling animals with alkyl-4-(4-higher alkyl substituted cyclohexyl)carbamates of the formula:



wherein

R is alkyl, cycloalkyl, cycloalkylalkyl, bicycloalkyl or tricycloalkyl;

R_1 is hydrogen, or alkyl; and

R_2 is alkyl.

Typical is methyl-N-(cis-4-cyclohexylmethylcyclohexyl)carbamate useful as an animal repellant.

3,678,172

ALLETHRONYL ESTERS OF CERTAIN CYCLOPROPANE-CARBOXYLIC ACIDS AS INSECTICIDES

Ira D. Hill, Middlesex; Barid B. Mukherjee, Piscataway, and Dale G. Brown, Middlesex, all of N.J., assignors to Tenneco Chemicals, Inc.

Filed Feb. 3, 1970, Ser. No. 8,387

Int. Cl. A01n 9/24

U.S. Cl. 424—306 **10 Claims**

Insecticidal compositions contain as their active ingredient allethronyl esters of 2,2-dichloro-3,3-dimethylcyclopropanecarboxylic acid and certain other cyclopropanecarboxylic acids.

3,678,173

BACTERICIDAL QUATERNARY AMMONIUM DERIVATIVES OF INDENE

Edward Griffin Shay, Belle Mead, and Edward A. Tavss, Jersey City, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Division of Ser. No. 857,573, Sept. 12, 1969, Pat. No. 3,636,115. This application April 9, 1971, Ser. No. 132,910

Int. Cl. A01n 9/20

U.S. Cl. 424—329 **2 Claims**

A method of microbiocidally treating a surface or treating hard water which comprises applying to the surface or admixing with the water microbiocidal quaternary ammonium derivatives of indene, at least some of which retain a high degree of their microbiocidal activity in hard water, the quaternary nitrogen having a long chain alkyl of eight to 18 carbon atoms, but preferably 12 to 14 carbon atoms and two lower alkyl chains of 1 to 4 carbon atoms attached thereto.

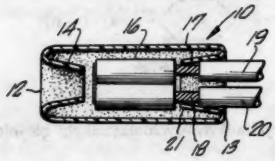
ELECTRICAL

3,678,174

SELF-LOCKING HEAT SHRINKABLE INSULATING SLEEVE

Harry E. Ganzhorn, Mountain View, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 15, 1971, Ser. No. 106,848
Int. Cl. H02g *15/08*
U.S. Cl. 174—84 R 18 Claims



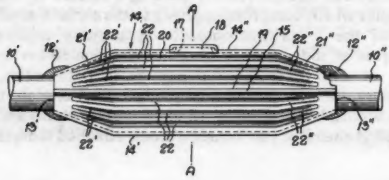
An insulation sleeve of the type used to provide electrical insulation around an electrical connection is disclosed. This sleeve has at least one end which has a re-entrant configuration projecting back into the interior of the sleeve such that at least a portion of the re-entrant is held away from the inside surface of the sleeve. This provides a self-locking feature when an object of an appropriate size is inserted through this end. The sleeve may then be heat shrunk around the connection or can serve as an insulator without further recovery. The sleeve may also be provided with a solder insert. A process for fabricating such a sleeve is also disclosed. Such sleeves are particularly useful for insulating an electrical connection made by a ferrule which has been crimped over the stripped ends of insulated conductors.

3,678,175

DEFORMABLE CASING JOINING CABLE ENDS

Edoardo Appiani, Milan, and Alberto Felici, Monza, both of Italy, assignors to Pirelli Societa Per Azioni Centro Pirelli, Milan, Italy

Filed Oct. 30, 1970, Ser. No. 85,469
Claims priority, application Italy, Dec. 9, 1969, 25501 A/69
Int. Cl. H02g *15/08*
U.S. Cl. 174—92 10 Claims



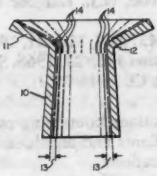
Casing for protecting joined cable ends surrounded by variable volume insulation which is of maximum cross-section at its center and tapers to a smaller size at its ends and which has longitudinally extending corrugations to permit it to expand and contract and thereby follow the volume variations of the insulation.

3,678,176

WIRE CLAMP TERMINAL CLIP OF THE FLANGED TUBULAR TYPE

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Aug. 26, 1970, Ser. No. 66,933
Int. Cl. H02g *15/08*
U.S. Cl. 174—94 R 5 Claims



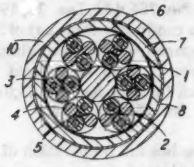
A terminal clip for the solderless connecting of electrical conductors to terminal posts, wherein the clip comprises a tubular body section having a flanged section formed on at least one end, and wherein the connection relies on a compressive metallic deformation in the tubular section against the conductor for clamping the conductor to the post. The clamping force provided by the clip is determined in accordance with the configuration and/or the hardness of the flange edge in combination with the configuration and/or the hardness of the strain relief point, or knee, where the flange section joins the tubular section. In response to a compressive force being applied to the clip in a direction parallel to the axis of the tubular section, the material at the knee yields before that of the flange edge, thereby reducing the internal diameter of the tube at the knee for providing the clamping connection.

3,678,177

TELECOMMUNICATION CABLES

Thomas Lawrenson, Helsby, England, assignor to British Insulated Callender's Cables Limited, London, England

Filed March 29, 1971, Ser. No. 128,830
Int. Cl. H01b *11/02*
U.S. Cl. 174—113 C 17 Claims

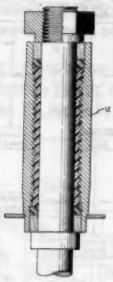


In a telecommunication cable comprising a plurality of pairs of twisted together insulated conductors in which one or each of the interstitial spaces present within the circumscribing cylinder of each of some or all of the pairs of insulated conductors is occupied by an elongate member of electrically insulating material, which elongate members serve to prevent displacement of one pair with respect to an adjacent pair, each elongate member is integral with or secured to one of the insulated conductors of the pair with which it is associated or is integral with or secure to the elongate member, when present, occupying the other interstitial space of the pair.

3,678,178
HIGH TEMPERATURE COMPRESSION SEAL TERMINAL

Philip Hubbauer, Clark, and Edwin John McHenry, Millington, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 18, 1971, Ser. No. 200,098
Int. Cl. H01b 17/30; H01m 1/02
U.S. Cl. 174—152 R 6 Claims

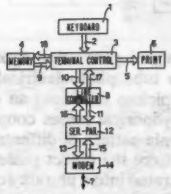


A battery seal terminal capable of withstanding high pressures, thermal and mechanical shocks and temperatures in excess of 135° C. includes a plastic sealant bushing radially compressed against the battery lead post by an outer metal sleeve, and two pairs of retainer rings, the first ring of each pair having sufficient elasticity to be press-fitted between the lead post and the sleeve to abut against an end of the bushing, and the second ring of each pair being of a rigid material and abutting against the first ring. The lead post extends through the sleeve at either end thereof. A hub is located on the lead post near one end of the sleeve and a portion of the lead post which extends beyond the sleeve at the other end is threaded. The bushing is then axially compressed between the ring pairs by drawing down a nut on the threaded end of the lead post.

3,678,179
TERMINAL APPARATUS

Francesco Serracchioli, and Francesco Restivo, both of Torino, Italy, assignors to Ing. C. Olivetti & Co., S.p.A., (Torino), Italy

Filed June 2, 1970, Ser. No. 42,716
Claims priority, application Italy, June 3, 1969, 52094 A/69
Int. Cl. H04l 15/34, 21/00, 15/12
U.S. Cl. 178—4.1 11 Claims

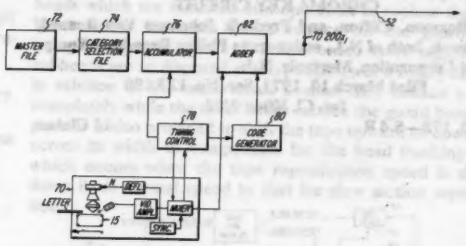


A printing terminal apparatus for data transmission is adapted to transmit at the beginning of each message sent to a central computer, a code combination indicative of the terminal operator and to print characters corresponding to said code combination in a predetermined position on the paper at the printing terminal. The code combination is automatically generated at the start of the message by inserting a lock-key into a corresponding lock and by depressing a key associated with the inserted lock-key.

3,678,180
RADIO FACSIMILE POSTAL SYSTEM FOR MULTIPLE ADDRESSEES

Donald Spencer Bond, Princeton, N.J., assignor to RCA Corporation

Filed Oct. 9, 1970, Ser. No. 79,574
Int. Cl. H04n 7/16
U.S. Cl. 178—5 6 Claims

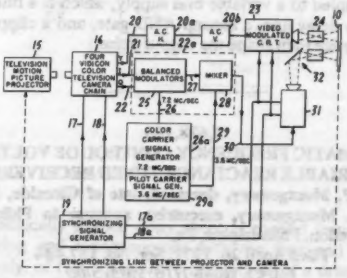


A radio facsimile postal system in which a plurality of code signals uniquely identifying the addressees to receive a "third class" mailing are sequentially transmitted prior to the transmission of image signals representative of the written message. In this manner, system subscribing addressees to receive such mailing will have the radio facsimile recorders of their receivers conditioned to respond to the particular message information subsequently transmitted.

3,678,181
COLOR FILM RECORDING AND REPRODUCING APPARATUS

Peter C. Goldmark, Stamford, and John M. Hollywood, Greenwich, both of Conn., assignors to Columbia Broadcasting System, Inc., New York, N.Y.

Continuation of Ser. No. 862,564, July 25, 1969, abandoned, which is a continuation of Ser. No. 519,106, Jan. 6, 1966, abandoned. This application Aug. 5, 1970, Ser. No. 61,424
Int. Cl. H04n 9/02, 5/84
U.S. Cl. 178—5.2 38 Claims



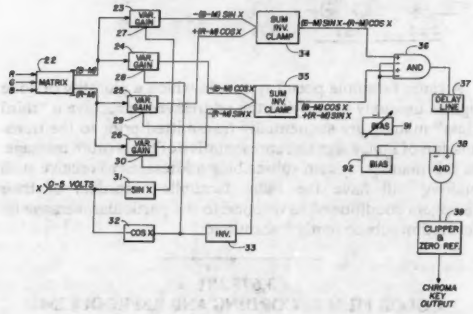
Apparatus and method for recording color picture information on a record medium, in which luminance information is recorded in one frame portion on the record medium and coded color information is recorded in a separate frame portion. Such luminance information may be in pictorial form and recorded either optically or electronically by a recording beam. The color information takes the form of a record including a first, carrier signal component modulated in amplitude and phase according to the color saturation and hue in the original scene and a superimposed reference carrier signal component bearing a fixed frequency relation to the color carrier signal, so that the recorded cycles of the respective carriers tend to be aligned in a common direction in the color frame. Recording may be carried out by scanning laser, elec-

tron or optical beam. as desired. The record medium may be reproduced by directing an image of a respective one of the frame portions to separate television cameras for producing a luminance signal and signals at the color and reference carrier frequencies.

3,678,182
CHROMA KEY CIRCUIT

Peter Boxman, Clifton, and Frederik Johannes Van Roessel, Mahwah, both of N.J., assignors to Philips Broadcast Equipment Corporation, Mortvale, N.J.

Filed March 12, 1971, Ser. No. 123,690
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 R **11 Claims**



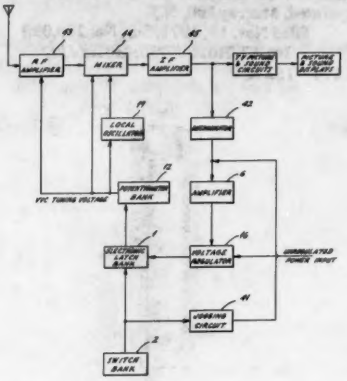
A circuit for generating an output pulse upon the occurrence of a selected color in color television signals features a matrix to form two chrominance difference signals. Four variable gain amplifiers multiply the difference signals by the sine and cosine of a control voltage which is a course color control. Two circuits each comprising a summer, inverter, and clamp circuit each add the outputs of two of the multiplied signals. An AND gate combines the output of the summer circuits and also is coupled to a variable bias supply, which is a fine color control. A delay line, a second AND gate, and a clipper and zero reference then shape the output pulse.

3,678,183
AUTOMATIC FREQUENCY CONTROL OF VOLTAGE VARIABLE REACTANCE TUNED RECEIVERS

Andrew P. Montgomery, deceased, late of Glenside, Pa. (by Ann P. Montgomery, executrix), assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed April 26, 1971, Ser. No. 137,484
Int. Cl. H04b 1/16; H03J 5/00
U.S. Cl. 178—5.8 AF **5 Claims**

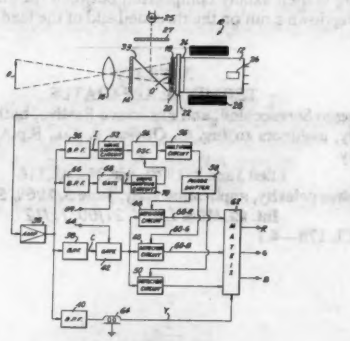
A jogging circuit is incorporated into the automatic frequency control system associated with touch-button tuning of television receivers that contain voltage variable reactance tuning elements. Each time a touch button is operated, the voltage applied to the tuning system is made to change first to a predetermined value and then return to its preset value. Thus the receiver tuning will be varied, each time a new channel is selected, so that the preset tuning is always approached from the low frequency side. Since the sound carrier is at the high frequency end of the television channel, spurious sound carrier locking is avoided.



3,678,184
INDEX SIGNAL GENERATING APPARATUS FOR SINGLE TUBE CAMERA

Hiromichi Kurokawa, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 21, 1970, Ser. No. 73,892
Int. Cl. H04n 9/06
U.S. Cl. 178—5.4 ST **11 Claims**



In a color video signal generating apparatus employing a single image pickup tube photoelectrically converting light projected onto the pickup tube into an electrical output, a screen of parallel cylindrical lenses cooperates with a filter constituted by a simple pattern of different colored filter elements so that light from the object passes through the filter elements and is separated into a plurality of color components whereby a portion of such image corresponding to each cylindrical lens is projected by the lens as separate color components on an effective area of the pickup tube to obtain from the latter a dot sequential chrominance signal, and means including a single light source are provided for projecting a first pattern of alternating light and dark images on the effective area of the pickup tube containing the projected color components and also projecting a second pattern of alternating light and dark images, of different pitch or width from the first pattern, on an area of the pickup tube means adjacent the aforementioned effective area so that the first and second pat-

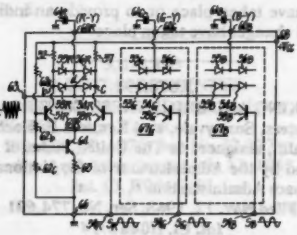
terns of images establish first and second frequency signals in the electrical output, which signals are utilized to derive a standard signal synchronized in phase with the sub-carrier of the chrominance signal to extract high resolution color video signals having the same sub-carrier frequency from the chrominance signal. Further, an arrangement is provided to control the horizontal scanning velocity of the pickup tube.

3,678,185

SEMICONDUCTOR CIRCUIT FOR PHASE COMPARISON

Takashi Okada, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed March 12, 1971, Ser. No. 123,540
Claims priority, application Japan, Oct. 13, 1970, 45/89877
Int. Cl. H04n *9/50*
U.S. Cl. 178—5.4 SD **11 Claims**



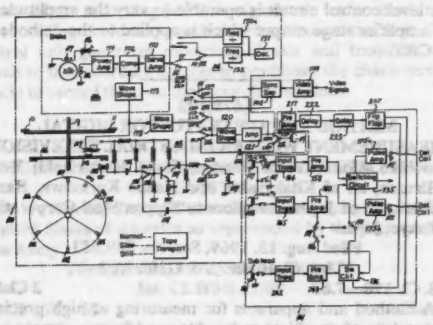
A semiconductor circuit for phase comparison which is devoid of capacitors and hence is suitable for use in an integrated circuit network, comprises a pair of transistors of the same conductivity type connected in the form of a differential amplifier and first and second bridging circuits including groups of series connected diodes and extending between one electrode of one of the transistors and the same electrode of the other transistor. The two input signals which are to be phase compared with each other are respectively supplied to one of the transistors and to the first bridging circuit, and a compared output signal is picked up from the second bridging circuit.

3,678,186

VIDEO TAPE RECORDER WITH SLOW MOTION REPRODUCING APPARATUS

Fujiaki Narita, Amagasaki, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi-shi, Japan

Filed Sept. 12, 1969, Ser. No. 857,504
Claims priority, application Japan, Sept. 14, 1968, 43/66284
Int. Cl. G11b *5/52, 15/52;* H04n *5/78*
U.S. Cl. 178—6.6 FS **13 Claims**



Video tape recorder with slow motion reproducing apparatus comprising rotating main and sub-heads scanning slant-wise over a tape which is transported in a longitudinal direction.

During normal speed reproduction, output signals reproduced by two of the heads tracing the recorded tracks are used to compose full or false field video signals.

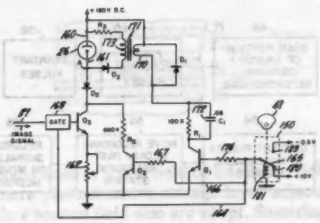
During slow motion reproduction, output signals are produced by the main heads retracing on the same track of the tape n times while the tape is transported at a speed of $(1/n)$ that of recording and output signals are produced by the subheads which are switched into operation to replace the main heads while the main heads retrace on the guard band between adjacent tracks of the recorded video signals. The subheads are so disposed at the periphery of a rotary member in relation to the main heads so that they retrace a track completely while the main heads retrace the guard band. Apparatus is also provided to shift the tape upward or downward across its width to compensate for the head tracking error which occurs when the tape reproduction speed is slowed down from normal speed to that for slow motion reproduction.

3,678,187

MECHANISMS AND CIRCUITS FOR FACSIMILE REPRODUCING SYSTEMS

Byron L. Barkman, Milford; William West Moe, Stratford, and Austin Ross, Monroe, all of Conn., assignors to Printing Developments, Inc., New York, N.Y.

Division of Ser. No. 698,255, Jan. 16, 1968, Pat. No. 3,558,813. This application Aug. 31, 1970, Ser. No. 68,169
Int. Cl. G11b *7/08;* H04n *1/24*
U.S. Cl. 178—6.7 R **4 Claims**



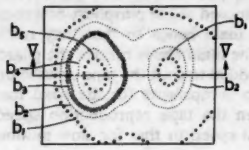
A cylindrically shaped copy sheet is rocked forward and back during and synchronously with the first and second, respectively, of two consecutive revolutions of a drum carrying film sheets. During the forward rocking, the copy sheet is line scanned and tone values detected by such scanning are converted into intensity modulations of light beams produced by glow lamps and scanning the film sheets to expose color separations thereon of the original. During the second revolution, the glow lamps are extinguished by transistorized circuits providing a firing voltage pulse for re-starting the lamps. Also during the second revolution, the copy sheet and film sheet are each moved an axial step to permit generation of congruent raster scanning patterns over all sheets. Means are provided to adjust the enlargement ratio.

The copy sheet is bent into cylindrical shape by pressing it against a template surface such that part of the sheet is backed by the surface and part projects into the scanning light beam therefor. The sheet is axially displaced relative to such beam by sliding the sheet over such surface.

3,678,188
METHOD FOR RECORDING A PHOTOGRAPHIC DENSITY

Minoru Okumura, Tokyo, Japan, assignor to Konishiroku Photo Industry Co., Ltd.

Filed Sept. 22, 1970, Ser. No. 74,426
Claims priority, application Japan, Oct. 4, 1969, 44/78967
Int. Cl. G01d 9/32; G01n 21/22; H04n 1/38
U.S. Cl. 178—6.6 R 1 Claim

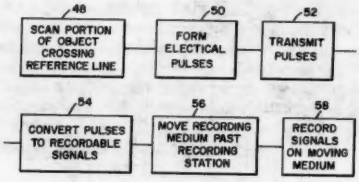


A method for recording a photographic density in the form of equi-density curves on a plane is described, in which alternate equi-density curves are depicted with different kinds of lines, and in which an equi-density curve corresponding to one particular density value serving as a reference is depicted with a line distinguishable from the other curves.

3,678,189
METHOD OF PRODUCING TIME-POSITION RECORDS OF OBJECTS

Robert A. Oswald, P.O. Box 458, Gardnerville, Nev.

Filed Dec. 11, 1969, Ser. No. 884,091
Int. Cl. H04n 3/34, 5/86, 7/10
U.S. Cl. 178—6.7 R 2 Claims



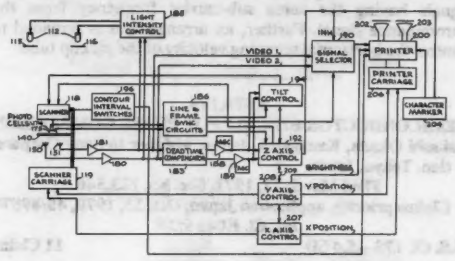
A time-position record of objects moving with respect to a reference line obtained by scanning those portions of the objects passing past the reference line with an electron beam to form output signals which are transmitted to a recording station. A recording medium is transported past the station at a speed proportional to the relative speeds between the object and the reference line. The output signals are converted into recordable signals which scan over the recording medium in a plane substantially perpendicular to the direction of movement of the recording medium to thereby form a record of the object as the object passes the reference line.

3,678,190
AUTOMATIC PHOTO COMPARISION SYSTEM

William H. Cook, Los Angeles, Calif., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.

Continuation of Ser. No. 274,452, April 22, 1963, abandoned.
This application Dec. 21, 1966, Ser. No. 605,951
Int. Cl. H04n 3/02
U.S. Cl. 178—6.8 16 Claims

Apparatus for automatically scanning sets of stereoscopic photographs, some of which represent particular terrain at other times than do the other photographs, and providing output representations of the terrain involved which may be compared automatically to show cultural changes in the terrain

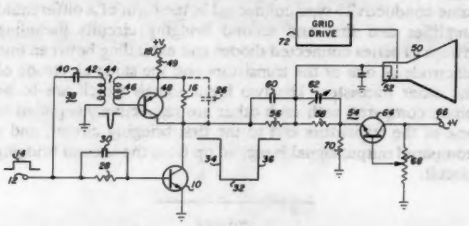


which may have taken place or to provide an indication that such cultural changes have taken place.

3,678,191
CRT BLANKING AND BRIGHTNESS CONTROL CIRCUIT

Robert L. Peters, Sunnyvale, and Kenneth F. Koch, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 12, 1968, Ser. No. 774,691
Int. Cl. H04n 5/14
U.S. Cl. 178—7.5 E 2 Claims



The disclosed embodiment of the present invention is a CRT blanking and brightness control circuit which employs an amplifier stage responsive to a square wave input signal and having an output connected to the cathode of a CRT, a wave shaping circuit connected to the load impedance of the amplifier stage, and a level control circuit connected to the output of the amplifier stage. The wave shaping circuit is responsive to the trailing edge of the input signal for discharging the stray capacitance associated with the load impedance to effect a fast rise time of the signal at the output of the amplifier stage. The level control circuit is operable to vary the amplitude of the amplifier stage output which is applied to the cathode of the CRT.

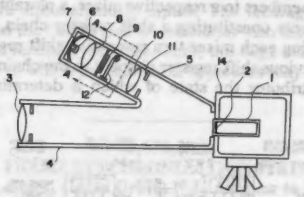
3,678,192
METHOD AND APPARATUS FOR DIGITAL MEASUREMENT WITH AN INDUSTRIAL TELEVISION

Tomohiko Akuta; Yoshi Honsyo; Sinya Hashirizaki; Teruo Hiruma, all of Kitakyushu, and Kazuo Kurasawa, Hamamatsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Aug. 13, 1969, Ser. No. 849,651
Int. Cl. H04n 7/18; G10b 7/02
U.S. Cl. 178—7.83 2 Claims

A method and apparatus for measuring at high precision dimensions of an object to be measured from a remote position by using an image pickup apparatus, wherein a scale graduated at a fixed spacing in the direction of the horizontal scanning line is projected on the photoelectric surface of the

image pickup apparatus, the image of the said scale is focused as superposed on the image of the object on the image pickup tube and video signal output of said projected scale lines corresponding to the length of the optical image of the dimension to be measured is taken out as voltage pulses, the number of which is counted.

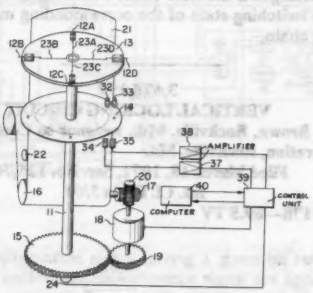


3,678,193

ELECTRONIC PRINTER

Hideo Yamamoto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 7, 1970, Ser. No. 52,927
Claims priority, application Japan, July 12, 1969, 44/55233
Int. Cl. H04n *1/00*
U.S. Cl. 178—18 **10 Claims**



The electronic printer which records the characters or indicia including alphanumerics, symbols and any other representations comprises a plurality of recording needles each of which moved with respect to a recording medium which is advanced at the right angle to the direction of movement of the recording needles and recording position detecting means associated with a movable member which moves in synchronism with the recording needles. In response to the detection of the recording position, signals are transmitted from the recording position detection means to a control unit. The control unit generates recording signals and transmits the signals to the recording needles to synthesize the characters or indicia to record them on the recording medium.

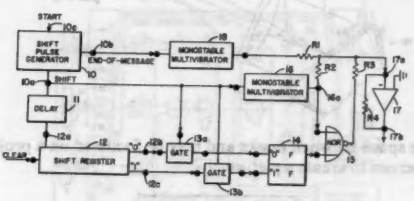
3,678,194

DIGITAL DATA TRANSMISSION AND DETECTION SYSTEM

Irving F. Orrell, Jr., Whittinsville, Mass., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 26, 1971, Ser. No. 109,875
Int. Cl. H04l *15/00*
U.S. Cl. 178—68 **4 Claims**

Information stored in a shift register in the form of data bits is serially read out to a logical circuit including gates, pulse stretchers, a storage flip-flop, a NOR gate, and a resistor summer. The output of the summer is connected to an operational amplifier feeding signals to a wire transmission line or a radio transmitter. The logical circuit is connected such that "0" data bits appear as zero voltage levels on the transmission line, and "1" bits appear as +V levels on the line. Space pulses are additionally provided between the data bits as +2V levels on the line, and an end-of-message level of +3V is provided



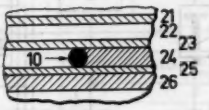
when the last bit is read from the shift register. The voltage levels are maintained during transmission by suitable amplifiers or may be restored at the receiver. The receiver inverts the incoming signals and adds +V. Voltage comparators are fed the resulting signal, and provide outputs for data bits, shift pulses, and end-of-message pulses.

3,678,195

SMEARING EFFECT ATTENUATION

Wolfgang Dillenburger, Darmstadt, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Continuation of Ser. No. 812,228, April 1, 1969, abandoned.
This application June 18, 1971, Ser. No. 154,635
Int. Cl. H04n *5/34*
U.S. Cl. 178—7.2 **12 Claims**



When sweeping lines in a first field of interlaced fields on a television camera photosensitive storage layer adjacent portions of lines in a second field also are swept. Smearing effect or image carryover is reduced by reducing migration or leakage of charge between unswept lines of the second field and swept lines of the first field. Preferably horizontal lines are narrowed by anamorphically projecting images on the coating, thus shrinking images vertically, while maintaining their horizontal dimensions. Alternatively beams may be oscillated vertically while sweeping horizontally, or vertical cross sectional dimensions of beams may be increased.

3,678,196

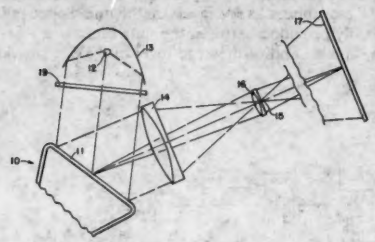
MEANS FOR PROJECTING AN ENLARGED TELEVISION IMAGE

Solo S. Roth, 1 Sherwood Terrace, Yonkers, N.Y.

Filed Oct. 20, 1970, Ser. No. 82,388
Int. Cl. H04n *3/16*
U.S. Cl. 178—7.5 D **8 Claims**

A projection means which includes the usual television receiving tube and its circuitry together with a plurality of bendable flaps secured to the outside surface of the tube. Conducting pins in the tube face transmit the electric charge received from the cathode ray to the flaps which then bend away from the pin ends due to the electrostatic repulsion. A source of light is directed towards the flaps which have a reflective coating on their outer surface. When the flaps are

not moved, all the reflected light is cut off by a series of metal masks, but when a flap is moved, the reflected light is directed



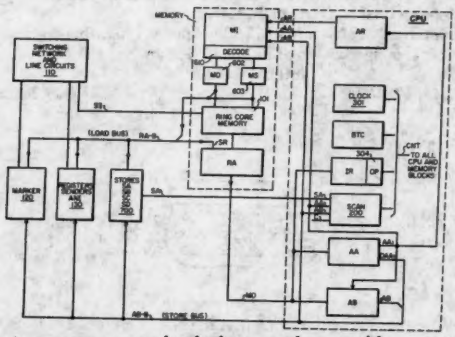
to the space between masks and may be focussed on a projection screen to create a picture.

3,678,197

DIAL PULSE INCOMING TRUNK AND REGISTER ARRANGEMENT

Robert B. Panter; John Peter Dufton; Robert W. Duthie, and George Verbaas, all of Brockville, Ontario, Canada, assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed March 9, 1971, Ser. No. 122,492
Int. Cl. H04m 7/00
U.S. Cl. 179—18 EB **10 Claims**



A common control telephone exchange with a central processor has a pool of dialing registers for connection to calling lines and trunks. Incoming dial pulse trunks without "-stop dial" are connected to registers using the regular links and marker. To increase the time for connection, the first dial pulse is detected in the trunk and forwarded as a resistance ground on one conductor via the network. The register has a polar relay to detect this potential, which is also used for party detection or coin detection on other calls. The central processor finds the calling line class of service, and for dial pulse trunks initiates the register so that "1" is added to the first digit, and the interdigital timer is started upon operation of the polar relay, so that even if the first digit is a "1" it is registered properly.

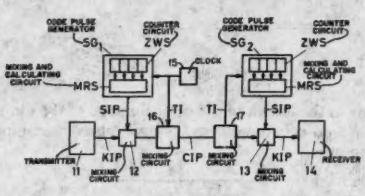
3,678,198

CIRCUIT FOR GENERATING A SERIES OF CIPHER PULSES

Kurt Ehrat, Scheuchzerstrasse 28, Zurich, Switzerland

Filed Jan. 8, 1963, Ser. No. 250,119
Claims priority, application Switzerland, Jan. 10, 1962, 246/62
Int. Cl. H04l 9/00
U.S. Cl. 178—22 **15 Claims**

15. A message transmission installation comprising at least two stations each capable of acting as a transmitter and receiver, each station comprising apparatus capable of acting as a transmitter and receiver of information, a mixer, and a circuit for generating reproducible series of code pulses having a long period, said circuit comprising a binary counting chain having at least 20 members, connections connecting each of said members to a respective mixer, a plurality of shift register elements constituting a shift register chain, connections connecting each mixer to a respective shift register element, to a previous shift register element in the chain and to a switching distributor the state of which is determined by a



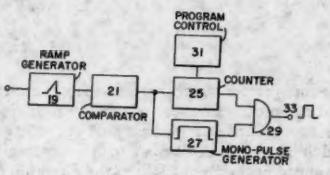
switching criterion, the arrangement being such that the mixers mix the information content of one counting member of the counting chain with the information of one shift register element and this mixed information is delivered to the next shift register element if the state of the switching distributor is in accordance with the switching state of the corresponding member of the counting chain, and that the information of one shift register element is delivered to the next shift register element unchanged if the state of the switching distributor differs from the switching state of the corresponding member of the counting chain.

3,678,199

VERTICAL LOCKING CIRCUIT

Buck C. Brown, Rockville, Md., assignor to Control Concepts Corporation, Rockville, Md.

Filed March 18, 1971, Ser. No. 125,769
Int. Cl. H04n 5/04
U.S. Cl. 178—69.5 TV **6 Claims**



A circuit for deriving accurate vertical time reference signals for locking or driving television apparatus, e.g., synchronization generators, to a composite video signal. The circuit also reduces errors due to noise, and permits vertical timing advances of up to two horizontal timing increments. The pulses of a synchronized pulse train each initiates the generation of a continuous ramp function which returns to its initial potential when the initiating pulse ends. If the sync pulse has a sufficient duration such as is characteristic of the vertical sync pulses, the ramp function will reach a threshold level. A comparator in response to the ramp function reaching a threshold level initiates a pulse and, when the ramp function returns to its initial potential, terminates the pulse. This threshold derived pulse is delivered to a flip-flop which changes state at the termination time. The flip-flop produces a pulse having a leading edge coincident with the trailing edge of the ramp function, the threshold pulse, and consequently with the trailing edge of the vertical sync pulses. The threshold pulse is also fed to a mono-pulse generator which produces a signal having a duration equal to or greater than the vertical sync interval or three horizontal time increments. A counter

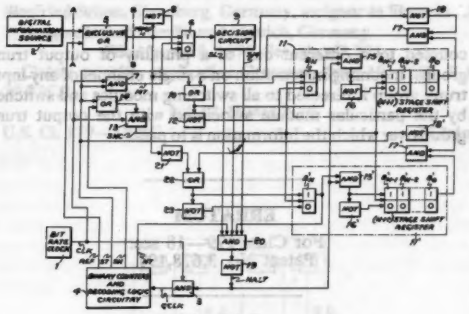
consisting of the aforementioned flip-flop and two additional flip-flops counts six pulses fed thereto by the comparator after which it generates an output pulse. The pulses from the counter and the mono-pulse are fed to an "and" circuit which gates the pulse only if both the mono-pulse and the counter output are simultaneously inputs. The leading edge of the pulse from the "and" gate is coincident with the trailing edge of the last vertical sync pulse. Thus, this edge defines an accurate time to which the television apparatus may be locked or driven.

3,678,200

FRAME SYNCHRONIZATION SYSTEM

James M. Clark, Cedar Grove, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 24, 1970, Ser. No. 66,396
Int. Cl. H04n *1/36*
U.S. Cl. 178—69.5 R **10 Claims**



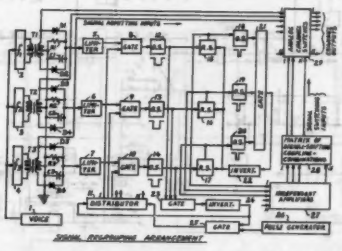
A binary information signal having a given bit rate and a local binary synchronization reference signal are applied to a digital comparator, the output signal thereof indicating a match or a mismatch between the binary condition of successive adjacent bits of the information signal and the reference signal. A flip flop samples the output signal of the comparator. A decision circuit responds to the samples to produce a first signal having binary "O" when the decision level is exceeded and a binary "1" when the decision level is not exceeded and a second signal having a binary "1" condition when the system is in a search mode and a binary "O" condition when the system is in a sense mode. The comparator output signal is also coupled through a first OR to a first (N+1) bit shift register which is triggered by a burst of pulses at the bit rate. The previous inputs to the first shift register are stored therein and the output thereof is also coupled through the first OR. The comparator output signal is inverted to provide a complement of this output signal and is coupled through a second OR to a second (N+1) bit shift register which is also triggered by a burst of pulses at the bit rate. The previous inputs to the second shift register are stored therein and the output thereof is also coupled through the second OR. An AND is coupled to the output of the first stage of both the first and second shift register and the decision circuit and produces an output signal therefrom only when simultaneously the first stage of both the shift registers indicates a mismatch and both the first and second signal from the decision circuit are in a binary "1" condition during halt time. This output signal is coupled to an inhibit arrangement disposed between a bit rate clock and binary counters to change the counting of the counters to achieve synchronization in less time than required by prior art frame synchronization systems.

3,678,201

BANDWIDTH COMPRESSION SYSTEM IN PHONETIC SOUND SPECTRUM

Meguer V. Kalfaian, 962 Hyperion Ave., Los Angeles, Calif.

Filed Dec. 14, 1970, Ser. No. 97,893
Int. Cl. G10l *1/00*
U.S. Cl. 179—1 SA **1 Claim**



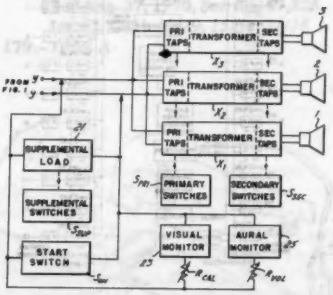
In sub-band divisions of speech sound waves the detected signals derived from the sub-bands are continually regrouped at the outputs of a numerically arranged bank of channels in an order that, the signal derived from the lowest frequency (pitch) in the sub-bands is continually shifted to the output of the first channel, while the other signals are shifted to the numerically positioned channel outputs by the same factors of multiplication from the first channel as the other sub-bands differ from said lowest frequency.

3,678,202

LOUDSPEAKER BALANCING SYSTEM

Nelson J. Rose, 419 E. Willow Grove Ave., Philadelphia, Pa.

Filed Nov. 24, 1969, Ser. No. 879,151
Int. Cl. H04r *27/00*
U.S. Cl. 179—1 AT **10 Claims**



A system is provided for setting up a multiple-speaker assembly, such as in a public address system or the like, to equalize loudspeaker output while total load remains matched to amplifier output and with a minimum of adjustment or readjustment.

3,678,203

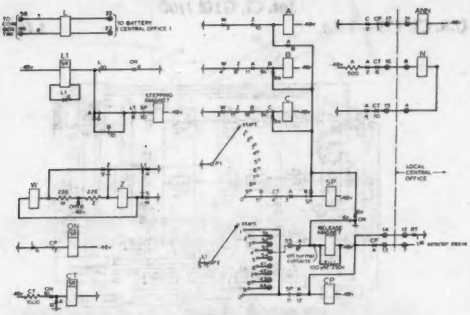
COIN OPERATED TELEPHONE NETWORK ALLOWING LIMITED FREE CALLS

Jean G. Lorange, Greenfield Park, Canada, assignor to The Bell Telephone Company of Canada, Montreal, Quebec, Canada

Filed Feb. 24, 1971, Ser. No. 118,385
Int. Cl. H04m *17/02*
U.S. Cl. 179—6.3 R **14 Claims**

Free calling from a coin operated subset is provided by the circuitry which allows contingent counting of dialled digits up

to a certain number and if said counting is completed preventing the dialling of further digits. If a coin has been deposited the completion of the counting is prevented and optional



completion of the counting is prevented on the dialling of certain digits indicative of otherwise free calls such as service calls.

3,678,204

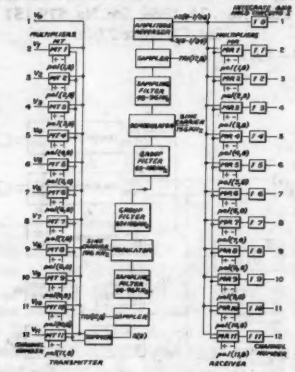
SIGNAL PROCESSING AND TRANSMISSION BY MEANS OF WALSH FUNCTIONS

Henning Friedolf Harmuth, Bethesda, Md., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Oct. 26, 1970, Ser. No. 84,025

Int. Cl. H04j *3/04*

U.S. Cl. 179—15 BC **4 Claims**



In the transmission by carrier waves a plurality of signals are produced and each multiplied by one of 12 Paley functions derived from a Hadamard matrix of rank 12. The resulting signals are added to form a multiplexed signal. The multiplexed signal is frequency limited by sampling it with a trigger function and passing the samples through a bandpass filter. Reconversion of the multiplex signal is accomplished at the receiver.

3,678,205

MODULAR SWITCHING NETWORK

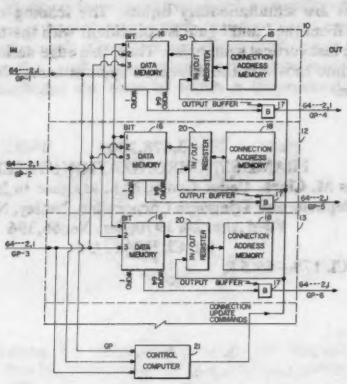
Gerald Cohen, and Maurice I. Crystal, both of Brookline, Mass.

Filed Jan. 4, 1971, Ser. No. 103,494

Int. Cl. H04q *3/60*; H04j *3/16*

U.S. Cl. 179—15 AQ **8 Claims**

A switching network employs a plurality of input trunk groups each having a predetermined number of input channels associated therewith. Each of a plurality of switching modules, the number of which corresponds to the number of incoming trunk groups, has a separate input connection from each of the plurality of input trunk groups and an output connection



coupled to a different one of a plurality of output trunk groups. Incoming information on a single channel of any input trunk group is directed to all switching modules and switched by the particular module associated with the output trunk group over which the information is to pass.

ERRATUM

For Class 179—18 see:
Patent No. 3,678,197

3,678,206

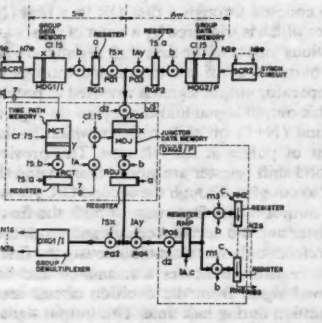
TDM SWITCHING NETWORK USING TIME SPACED CONTROL SIGNALS

Jacques Georges Dupleux, Issy-les-Moulineaux; Jean-Claude Gadre, Boulogne-Brillancourt, both of France; Jean-Pierre Le Corre, deceased, late of Sainte-Genevieve-Des-Bois, France (by Yvette Marie Laurence Le Corre, administratrix), and Jean Francois Pierre Julien Loisel, Versailles, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 2, 1970, Ser. No. 7,477

Int. Cl. H04q *11/00*

U.S. Cl. 179—18 J **1 Claim**



The description covers the general organization of a switching network for a TDM exchange using PCM principles. The network comprises two selection stages and there is a par-

ticular grouping of the space, time and junctor memories which simplifies their access and which allows for a ready extension of the capacity of the network. The switching network may establish a special connection for the supervision of a traffic connection between a calling channel and an outgoing channel by using a junctor different from that used for the traffic connection. Thus in order to supervise the messages sent from the calling channel to the outgoing channel, there is established a first partial connection from the calling channel to the intermediate junctor on a first synchronous signal and using one address connection and a second partial connection from the junctor to the outgoing channel on an asynchronous signal spaced in time from said first signal, the channel having a second address. The two partial connections complete the connection through the switching network to complete the connection.

3,678,207

CIRCUIT ARRANGEMENT FOR TELEPHONE PRIVATE BRANCH EXCHANGES PERMITTING CONFERENCE CALLS BETWEEN SUBSCRIBER SETS HAVING VIDEO TRANSMISSION CAPABILITIES

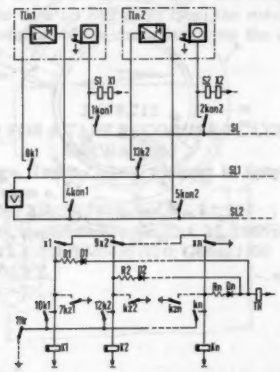
Siegfried Schon, Starnberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 18, 1970, Ser. No. 47,321

Claims priority, application Germany, June 19, 1969, P 19 30 925.2

Int. Cl. H04m *3/56*

U.S. Cl. 179—18 BC **3 Claims**



A circuit arrangement is described for permitting conference calls between subscriber stations in a telephone private branch exchange wherein said subscriber stations, or at least a portion of them are equipped to transmit and receive video signals. When the conference call is initiated, the video receivers of the calling subscriber and the called subscribers are connected to a transmission line. At the initiation of the call, only the video transmitting means of the calling subscriber is connected to a second transmission line. The latter two transmission lines are electrically connected by means of an amplifier. Each of the called subscribers are connected to said first transmission line only by their video receiving means. Each of the called subscriber sets is equipped with a means by which the subscriber transmitting video can be disconnected from the line, and the subscriber actuating said means can connect his video transmitting means to the line. The switching means utilized will permit only one video transmitter to be connected to the line at any given time.

3,678,208

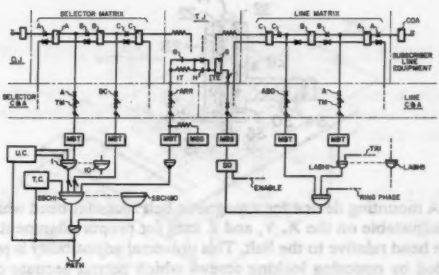
MARKER PATH FINDING ARRANGEMENT INCLUDING IMMEDIATE RING

John W. Eddy, Villa Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed April 12, 1971, Ser. No. 133,114

Int. Cl. H04q *3/42*

U.S. Cl. 179—18 GE **8 Claims**



The disclosure relates to an arrangement in a marker pathfinding scheme for providing immediate ringing of the called subscriber terminal. The terminating junctors available to a called terminal are divided into groups with each group receiving the ringing current in a different time period. Each ringing period is preceded by an enabling pulse such that the marker in its pathfinding operation tests first those terminating junctors corresponding to the then occurring enabling pulse.

3,678,209

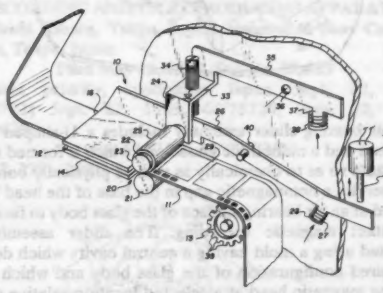
STRIP MATERIAL HANDLING MECHANISM FOR SOUND SYSTEMS

Robert S. Vukosic, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 27, 1970, Ser. No. 67,325

Int. Cl. G11b *15/29, 15/34, 21/16*

U.S. Cl. 179—100.1 A **5 Claims**

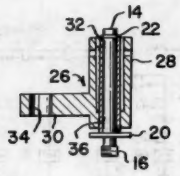


A strip material handling mechanism comprises a rotatable sprocket wheel for moving strip material along a threading path in either of two directions through an openable sound gate having opposed pressure pads, a capstan drive assembly including a capstan and a pressure roller, and a single control element for enabling independent opening of the sound gate and capstan drive assembly during reverse projection. Utilizing a single control element, the pressure roller and one of the pressure pads are independently disengaged from the strip material during such operational mode, thereby permitting the rotatable sprocket wheel to move strip material substantially free of restraint that might otherwise be imposed by such pressure roller and pad.

3,678,210
MAGNETIC BELT RECORDER HEAD ADJUSTMENT

William D. Richards, Medway, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed May 17, 1971, Ser. No. 144,013
Int. Cl. G11b 5/56, 21/24
U.S. Cl. 179—100.2 CA 1 Claim

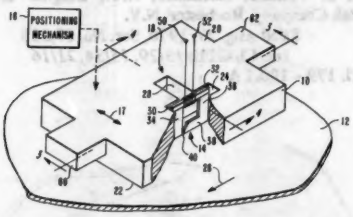


A mounting device for a magnetic belt recorder head which is adjustable on the X, Y, and Z axes for proper alignment of the head relative to the belt. This universal adjustibility is provided by opposing locking screws which permit arcuate displacement about X and Z axes and a spindle mount which permits arcuate movement about a Y axis.

3,678,211
AIR BEARING MAGNETIC HEAD WITH GLASS SLIDER BODY

Helen M. Hoogendorn; Bernt Narken, both of Poughkeepsie, N.Y.; Paul J. Roeder, Carmel, Ind., and Brian Sunners, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1969, Ser. No. 850,764
Int. Cl. G11b 5/60, 5/10, 5/42
U.S. Cl. 179—100.2 P 6 Claims



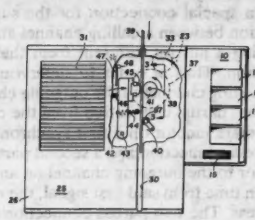
An air bearing slider assembly includes a U-shaped magnetic head and a monolithic glass body which is formed in the glassy state so as to chemically as well as physically bond the head thereto, a nonmagnetic gap in the base of the head being disposed at an air bearing surface of the glass body to facilitate noncontact magnetic recording. The slider assembly is fabricated using a mold having a central cavity which defines the desired configuration of the glass body and which positions the magnetic head at a selected location relative to the glass body to be formed. The mold cavity is filled with a fluid glass composition which solidifies as a monolithic body in bonded relation to the head.

3,678,212
PLANAR DRIVE ADAPTER FOR CASSETTE TAPE RECORDER

Albert F. Wild, Rochester, N.Y., assignor to Tapecon, Inc., Rochester, N.Y.

Filed April 22, 1970, Ser. No. 30,653
Int. Cl. G11b 5/80, 25/04
U.S. Cl. 179—100.2 Z 27 Claims

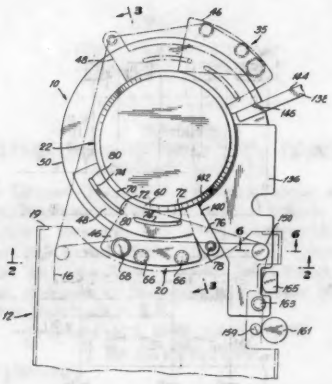
A planar drive adapter converts a cassette tape recorder for playing flat cards having magnetic strips. The adapter housing fits into the cassette slot of the recorder and the adapter carries its own magnetic head and card drive wheel, but uses the electronic circuitry and drive power of the recorder.



3,678,213
MAGNETIC RECORDING AND/OR REPRODUCING SYSTEM HAVING GUIDE PINS MOUNTED ON INDEPENDENTLY ROTATING PLATES FOR WITHDRAWING TAPE FROM CASSETTE

Seizi Sato, Kanagawa, Japan, assignor to Sony Corporation, Toyko, Japan

Filed Sept. 18, 1970, Ser. No. 73,561
Claims priority, application Japan, Sept. 19, 1969, 44/74870
Int. Cl. G11b 15/66, 23/04
U.S. Cl. 179—100.2 Z 14 Claims



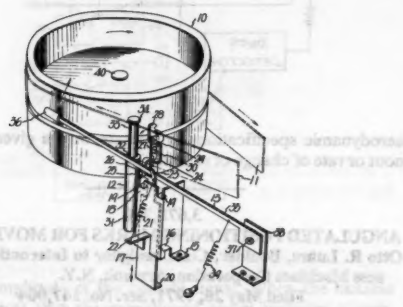
In a tape recording and reproducing device adapted for use with magnetic tape cassettes and having a rotary magnetic head for recording and reproducing signals on the tape while the latter is wrapped about a guide drum, an apparatus is provided for withdrawing the tape from the cassette and guiding the tape into contact with the guide drum for skewed scanning by the head or heads. The tape guiding apparatus includes first and second tape guide members mounted for movement on the device along a generally arcuate path about the periphery of the drum from a first station adjacent the cassette to a second station remote from the cassette, and each of the guide members includes a guide pin or pins for engaging the tape within the cassette and guiding the tape about the guide drum. The guide pin on the first guide member, when located at the second station, holds the tape in wrapped engagement with the guide drum, and the guide pin, on the second guide member guides the tape along a return path remote from the drum back to the cassette. The first and second guide members are operably connected for relative movement therebetween during movement from the first to the second station.

3,678,214

MAGNETIC TAPE UNLOADING MECHANISM FOR USE WITH A TAPE RECORD PLAYBACK MECHANISM

Yotaro Miura, Toyko, and Makoto Ito, Chiba-ken, both of Japan, assignors to Sony Corporation, Toyko, Japan

Filed Aug. 21, 1970, Ser. No. 65,811
Claims priority, application Japan, Jan. 24, 1970, 45/6486
Int. Cl. G11b *5/76*
U.S. Cl. 179—100.2 T 8 Claims



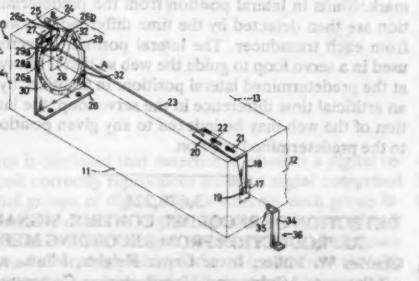
A mechanism for automatically removing a magnetic tape from around a drum having magnetic heads therein for recording and playing back signals on the magnetic tape. An arm which is pivoted has one end which bears against the tape. A slide member moves the arm upwardly and away from the tape to eject the tape up and away from the rotating drum. The rotary movement of the drum facilitates the ejection of the tape.

3,678,215

COUNTER FOR A TAPE RECORDER/PLAYBACK MECHANISM

Nobutoshi Kihara, Toyko, Japan, assignor to Sony Corporation, Toyko, Japan

Filed Aug. 5, 1970, Ser. No. 61,221
Claims priority, application Japan, Oct. 25, 1969, 44/10375
Int. Cl. G11b *23/04, 27/20;* G06m *1/08*
U.S. Cl. 179—100.2 Z 5 Claims



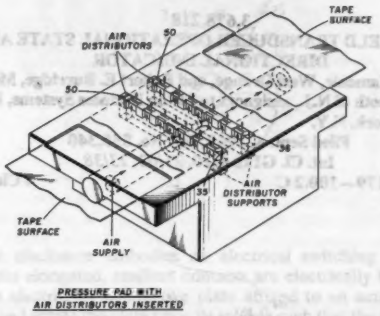
A tape cassette for use with a video tape recorder having a counter mounted in the cassette to indicate to the user, or other concerned parties, the amount of time the material which is recorded on the magnetic tape within the cassette has been used. The counter can only operate when it is properly mated with a member on the VTR chassis and a ratchet and pawl mechanism in which indicia is printed on the ratchet.

3,678,216

AIR DISTRIBUTOR FOR OBTAINING UNIFORM HEAD-TAPE CONTACT IN MAGNETIC TAPE TRANSPORT

Jack J. Rousso, Jr., and George N. Willman, both of Dallas, Tex., assignors to Mobil Oil Corporation

Filed July 14, 1970, Ser. No. 54,717
Int. Cl. G11b *5/60;* B65h *17/28*
U.S. Cl. 179—100.2 P 5 Claims



PRESSURE PAD WITH AIR DISTRIBUTORS INSERTED

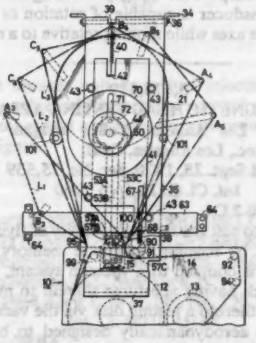
The specification discloses an air distributor for evenly distributing the flow of air against the width of a magnetic tape to maintain the tape along its entire width adjacent a read/write headstack of a tape transport to enhance the read/write reliability of the transport. The air distributor comprises structure having a plurality of passageways arranged in at least one array along a given dimension of the structure. The passageways increase in size outward from the center of the array. In the embodiment disclosed, the distributor has two arrays of passageways formed in opposite edges of the structure. The distributor is supported in the transport in a manner to locate the arrays substantially perpendicular to the direction of travel of the tape and the passageways perpendicular to the plane of the tape.

3,678,217

WITHDRAWING A MAGNETIC RECORDING TAPE FROM A CASSETTE AND ENGAGING A LOOP FORMED IN THE TAPE WITH THE GUIDE DRUM OF A MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS

Nobutoshi Kihara, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 15, 1970, Ser. No. 37,623
Claims priority, application Japan, Sept. 22, 1969, 44/75721; Sept. 22, 1969, 44/75720; Sept. 22, 1969, 44/90629
Int. Cl. G11b *15/66, 23/04*
U.S. Cl. 179—100.2 T 14 Claims



A plurality of fingers which are movable longitudinally and

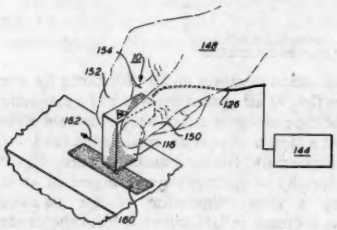
rotatably are mounted on a video tape recorder housing. The fingers grasp the portion of magnetic tape which is between the ends of supply and take-up reels and form this portion of the tape into a loop. The loop is automatically drawn over the circumference of a record/playback head and is automatically removed therefrom without the operator touching the tape. Provision is also made to preclude the inadvertent removal of the tape during a play or record cycle.

3,678,218

HANDHELD TRANSDUCER OPERATIONAL STATE AND DIRECTIONAL INDICATOR

Melvin Kamenir, West Orange, and Robert E. Burridge, Montclair, both of N.J., assignors to Litton Business Systems, Inc., New York, N.Y.

Filed Sept. 4, 1969, Ser. No. 855,340
Int. Cl. G11b *5/10, 21/02, 23/38*
U.S. Cl. 179—100.2 C **4 Claims**



A handheld magnetic transducer comprises a gun-shaped housing having a directional arrow on one surface. The arrow is illuminated by a light within the housing indicating the operating state of the transducer as determined by a signal device. The housing has dimples in opposed side walls for ease of grasping. The armature is in two parts. Each part has a T-shaped portion the crossbars of which overlap. The armature is inserted within the bobbin and is resiliently held at the crossbars to lock into position with a shim. The bobbin front wall in combination with the armature and shim form the muzzle or reading end of the transducer and has a substantially frustro pyramidal shape. The armature-bobbin structure is held in place by fingers which form a part of the transducer housing. The wires from the coil are secured to clips. The clips or terminal are U-shaped members spring retained on arms of the bobbin. The clips each have a flange portion for engaging an aperture in the arm. The reading portion of the transducer is hemispherical in shape with the gap defining an arc thereon such that the transducer is capable of rotation or positioning about one of three axes while moving relative to a record.

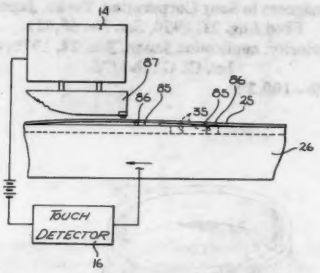
3,678,219

FLYING MAGNETIC HEAD TESTING APPARATUS

Willard Dennis, Los Angeles, Calif., assignor to Willard Laboratories, Inc., Los Angeles, Calif.

Filed Sept. 25, 1970, Ser. No. 75,539
Int. Cl. G11b *5/46, 5/60*
U.S. Cl. 179—100.2 CA **30 Claims**

An apparatus to test the flying capability of flying magnetic heads employed by rotating, magnetic memory systems. A rotatable chuck is coupled to a vacuum system, the top surface of the chuck having apertures therein to make contact with and secure thereto a testing disk via the vacuum system. Magnetic heads aerodynamically designed to be employed over a rotating disk or drum are suspended over the surface of the testing disk. A touch detector is connected between the magnetic head and the testing disk to determine whether or not the flying magnetic head is within the designed



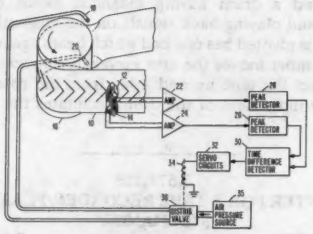
aerodynamic specifications to operate with a given disk runout or rate of change of runout.

3,678,220

ANGULATED POSITIONING MARKS FOR MOVING WEB

Otto R. Luhrs, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1971, Ser. No. 147,004
Int. Cl. G11b *5/56, 21/10*
U.S. Cl. 179—100.2 S **8 Claims**



Lateral position of a moving web is detected to an accuracy of tenths of a mil. In particular, a moving magnetic tape is monitored for shifts in lateral position by detecting "V" shaped marks on the tape. Each arm of the "V" is monitored by a separate transducer. The transducers are positioned relative to the "V" mark so that, for a predetermined lateral position of the moving tape, there is no time difference between each transducer reading its corresponding arm of the "V" mark. Shifts in lateral position from the predetermined position are then detected by the time difference between pulses from each transducer. The lateral position detector may be used in a servo loop to guide the web so that it always remains at the predetermined lateral position. In addition, by inserting an artificial time difference in the servo loop, the lateral position of the web may be indexed to any given position relative to the predetermined position.

3,678,221

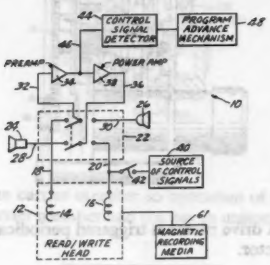
DETECTION OF RECORDED CONTROL SIGNALS UPON REPRODUCTION FROM RECORDING MEDIUM

Charles W. Miller, Inver Grove Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 11, 1969, Ser. No. 857,097
Int. Cl. G11b *23/36*
U.S. Cl. 179—100.2 S **2 Claims**

An apparatus for detecting a reproduced sinusoidal control signal which is recorded on a recording medium with an informational signal and within the frequency band of the informa-

tion signal, wherein the recorded amplitude of the informational signal is lower than the recorded amplitude of the control signal at and below the frequency of the control signal. A bistable circuit including a Schmitt trigger is used to detect when a signal reproduced from a recording medium includes a component of at least a minimum amplitude correlated to the



recorded amplitude of the control signal. When the bistable circuit detects that the reproduced signal includes a component of at least such minimum amplitude, an integrating circuit is then enabled to determine whether this component also has a one-half cyclic period which is at least the duration of one-half the cyclic period of the control signal.

3,678,222

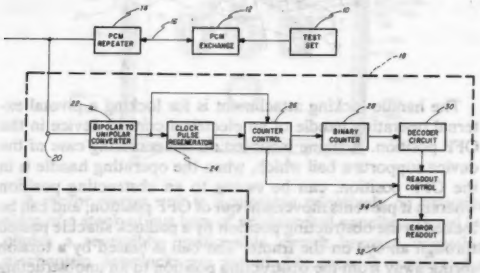
TEST APPARATUS FOR DIGITAL REPEATERS

Michael A. Boehly, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Nov. 25, 1970, Ser. No. 92,589

Int. Cl. H04b *1/60*

U.S. Cl. 179—175.31 R **6 Claims**



Apparatus is disclosed that determines whether a digital repeater circuit correctly reproduces an input signal comprised of sequential groups of digital signals wherein each group includes a preset number of digital signals. A counter circuit receives a count corresponding to the number of digital signals in a group, and an error signal is produced in the event that the count at the end of a group of signals does not correspond to the preset number.

ERRATUM

For Class 191—1 see:
Patent No. 3,678,226

3,678,223

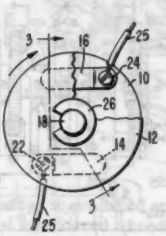
DIAL TYPE SWITCH WITH IMPROVED LEAF SPRING BIASED ROTATABLE CONTACT PLATE

Thomas E. Zopfi, Grand Rapids, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed April 13, 1970, Ser. No. 27,787

Int. Cl. H01h *1/12, 19/58*

U.S. Cl. 200—11 G **5 Claims**



The disclosure embodies an electrical switching device wherein elongated, resilient contacts are electrically bridged by an electrically conductive plate affixed to an actuatable shaft and rotate the plate upon its release such that the respective points of contact between the resilient contacts and the plate will differ on subsequent operative cycles.

3,678,224

CONTACT BREAKER INCORPORATING FUEL INJECTION TIMING SWITCHES

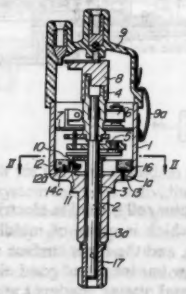
Yosiaki Takeda, Nagoya, Japan, assignor to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Aug. 20, 1970, Ser. No. 65,587

Claims priority, application Japan, Sept. 10, 1969, 44/71838; April 3, 1970, 45/32388; April 2, 1970, 45/31714; April 2, 1970, 45/31718; April 2, 1970, 45/31719

Int. Cl. H01h *51/28;* **F02p** *5/08*

U.S. Cl. 200—19 M **6 Claims**



A contact breaker unit for a fuel injection type internal combustion engine, which includes a switch mechanism having reed switches and a magnet for generating the fuel injection timing signal.

3,678,225

REPEAT CYCLE TIMER OF MODULAR CONSTRUCTION WITH IMPROVED ADJUSTABLE CAM

Harold D. Hulterstrum, Baraboo, Wis., assignor to Gulf & Western Industries, Inc., New York, N.Y.

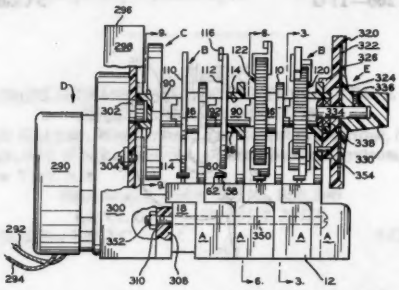
Filed April 1, 1971, Ser. No. 130,100

Int. Cl. H01h *43/10*

U.S. Cl. 200—38 BA **24 Claims**

A repeat cycle timer of the type wherein a plurality of cams are coaxially rotated through a timed cycle to effect sequential

energization of a plurality of switches adapted to control electrical elements remote therefrom. The timer is comprised of a plurality of identical interchangeable cam modules each including a cam hub and at least one switch associated



therewith. The adjacent modules and cam hubs are rotatably driven by drive means. Certain of the cam hubs include adjustable cam surfaces thereon to permit variable switch programs to be presented.

3,678,226

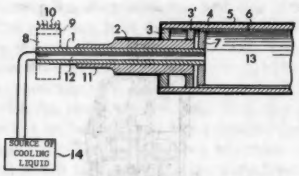
HOLLOW CONDUCTOR ROLL

Hiroyuki Hatagi; Kenichi Kanamaru, and Yasuo Funasaki, all of Fukuyama shi, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1968, Ser. No. 767,419

Int. Cl. B01k *3/00*

U.S. Cl. 191—1 A **10 Claims**



A hollow conductor roll is used in electrical zinc plating, the outer surface of which is made of middle carbon steel and hard metal plating, and the inner surface of which is made of pure metal with low hardness and good electric conductivity. The hard outer metal plating renders the roll less susceptible to damage thereby reducing production cost and the hollow roll is relatively easy to cool by passing cooling liquid therethrough.

3,678,227

CAM OPERATED PROGRAM MECHANISM WITH MECHANICAL VIBRATORY ACTUATING MEANS

Eckhart Graf, Oberbaldingen, Germany, assignor to Firma Fried. Ernst Benzing, Schwenningen/N. Karlstr., Kontrolluhrenfabrik, Germany

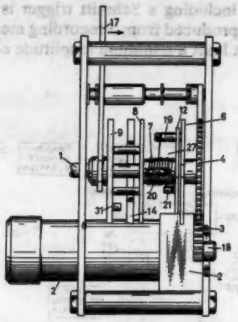
Filed July 8, 1971, Ser. No. 160,709

Claims priority, application Switzerland, July 22, 1970, 11098/70

Int. Cl. H01h *7/08, 43/10*

U.S. Cl. 200—38 R **10 Claims**

A tripping mechanism for a power unit for the drive of time-related rotating contactors requiring a powerful torque for



their drive. A drive motor is triggered periodically, thus driving the contactor.

3,678,228

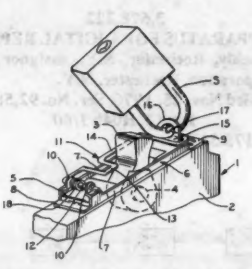
HANDLE LOCKING ATTACHMENT FOR ELECTRICAL CONTROL DEVICES

Wayne G. Adamson, Fairfax, Iowa, assignor to Square D Company, Park Ridge, Ill.

Filed Oct. 23, 1970, Ser. No. 83,263

Int. Cl. H01h *27/00*

U.S. Cl. 200—42 T **4 Claims**



The handle locking attachment is for locking a pivotal external operating handle of an electrical control device in the OFF position. A frame mounted on the enclosing case of the device supports a bail which, when the operating handle is in the OFF position, can be swung to an obstructing position wherein it prevents movement out of OFF position, and can be locked in the obstructing position by a padlock shackle passed through an eye on the frame. The bail is biased by a torsion spring away from the obstructing position to an unobstructing position in which it is juxtaposed against the front face of the case so as not to interfere with the closure of the door of a load center cabinet in which the control device is mounted.

3,678,229

SPRING MOUNTED KEY FOR ELECTRICAL SWITCH

Thomas F. Osika, Gary, Ind., assignor to McGill Manufacturing Company, Inc., Valparaiso, Ind.

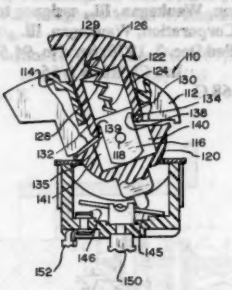
Continuation-in-part of Ser. No. 101,934, Dec. 28, 1970. This application Oct. 13, 1971, Ser. No. 188,720

Int. Cl. H01h *27/00*

U.S. Cl. 200—42 T **6 Claims**

A key operated electrical switch includes rocker and carrier members connected to the switch casing with a common axle. The rocker and the carrier members are free to rotate relative to one another about the axle with the carrier member moving into a cavity in the rocker. A key is connected by a spring

device to the rocker which spring biases the key out of the carrier member. Pressure on the key by the operator moves the same into the carrier member so operation of the rocker will move the carrier member and the key in unison to operate the switch.



3,678,230

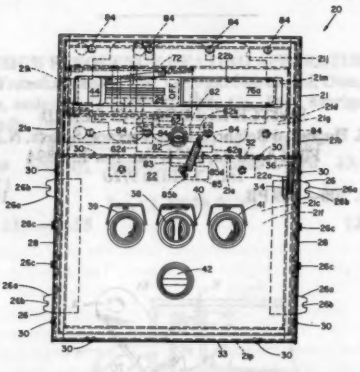
MOTOR STARTER UNIT WITH INTERLOCK MEANS FOR SELECTIVELY MOUNTABLE CIRCUIT BREAKER OPERATING MECHANISM

Tadeusz J. Rys, Lexington, Ky., assignor to Square D Company, Park Ridge, Ill.

Filed April 28, 1971, Ser. No. 138,137

Int. Cl. H01h *9/22*

U.S. Cl. 200—50 A **10 Claims**



A motor starter unit is mountable selectively on opposite sides of a stack of bus bars of an electrical panelboard and includes a reversibly positionable circuit breaker operating mechanism. Interlocks are provided to prevent opening of a cover of the motor starter unit when a handle of the operating mechanism is in ON position, unless an interlock-defeating screw is first turned, and to prevent movement of the handle to ON position when the cover is open.

3,678,231

APPARATUS FOR DETECTING RAPID CHANGE OF FLUID PRESSURE

Michael John Underwood, Croydon, England, assignor to Negretti & Zambra (Aviation) Limited, Croydon, England

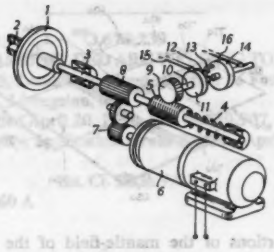
Filed July 26, 1971, Ser. No. 166,215

Claims priority, application Great Britain, July 28, 1970, 36,533/70

Int. Cl. H01h *35/24, 35/32*

U.S. Cl. 200—81 R **13 Claims**

An apparatus for detecting a rapid change in fluid pressure such as occurs in aircraft engine failure, comprises means such as a capsule for transforming pressure change into a velocity and means such as an electric motor for producing a reference velocity. The two velocities so produced are compared or differentiated and a signal is produced when the velocities differ by more than a predetermined amount. The signal can be adapted to actuate automatically a re-light sequence for an aircraft engine.



3,678,232

LIQUID RESERVOIRS

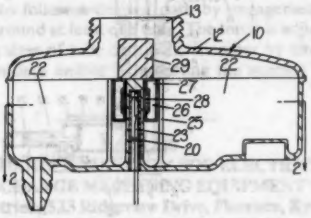
Peter Kinson Hodges, Solihull, England, assignor to Girling Limited, Birmingham, England

Filed Dec. 23, 1970, Ser. No. 101,081

Claims priority, application Great Britain, Jan. 10, 1970, 1,319/70; March 10, 1970, 11,409/70

Int. Cl. H01h *35/18*

U.S. Cl. 200—84 C **7 Claims**



A liquid reservoir for use with a tandem master cylinder of a vehicle hydraulic system includes a dividing wall which serves to define a pair of chembers, the diving wall also defines in the chambers respectively guideways which guide the vertical movement of float assemblies. Each float assembly includes a magnet operable to close a pair of contacts in a switch housed in the dividing wall when the liquid level in the respective chamber falls below a predetermined level.

3,678,233

STANDARDIZED SET OF COMPENSATING FILTERS FOR MANTLE-FIELD RADIATION THERAPY

Frederick L. Faw, Vienna, Va.; Ralph E. Johnson, Rockville, Md.; Constance A. Warren, Ithaca, N.Y., and Dwight W. Glenn, Adelphi, Md., assignors to The United States of America as represented by the Secretary of Health, Education and Welfare

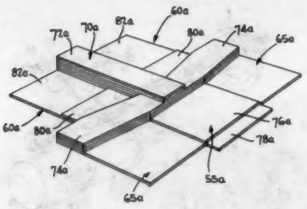
Filed April 2, 1970, Ser. No. 25,075

Int. Cl. H05g *3/00*

U.S. Cl. 250—86 **5 Claims**

A standardized set of compensating filters for "mantle-field" radiotherapy. The set of compensating filters is supported in a filter-holder interposed between the radiation

source and the patient and includes a plurality of individual filter elements which are selectively combined to provide the



various portions of the mantle-field of the patient with a predetermined, reproducible radiation dosage.

3,678,234

COMPRESSED GAS SWITCH HAVING COLUMNAR CONSTRUCTION

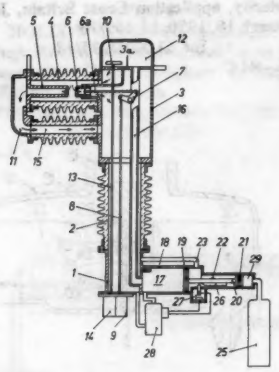
Dieter Floessel, Fislisbach, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed June 8, 1970, Ser. No. 44,517

Claims priority, application Switzerland, June 18, 1969, 9275/69

Int. Cl. H01h *33/57*

U.S. Cl. 200—148 B **7 Claims**



An electrical circuit breaker in which a pressurized gas such as SF_6 operating on a closed gas circuit is utilized to extinguish the arc drawn between the switching contacts and perhaps also to actuate the contacts themselves includes an upstanding hollow insulator column at the top of which is supported a switch contact chamber and an adjacently located readiness tank containing the pressurized gas ready for delivery to the contact chamber as soon as a switching-out sequence is initiated.

To assure rapid replenishment of the gas in the readiness tank so that a second switching-out operation can take place immediately, and at the same gas pressure as the first one should this be necessary, for example, due to the persistence of a short circuit on the line to which the breaker is connected, replenishment gas is stored in a cylinder at the lower end of the insulator column and this cylinder contains a piston which is driven in a direction to expell the gas stored in the cylinder and deliver it to the readiness tank through an interconnecting pipe line as soon as the gas pressure drops in the readiness tank as a result of delivery of the pressurized gas from the latter into the switch contact chamber. Thus the drop in gas pressure in the readiness tank resulting from the first disconnection of the switching contacts is compensated for and restored immediately by the re-pressurizing action resulting from the displacement of the piston.

3,678,235

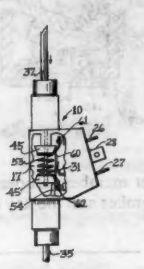
AXIALLY RECIPROCAL ACTUATOR FOR A SEALED SWITCH

Fred N. Anderson, Waukegan, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Dec. 2, 1970, Ser. No. 94,500

Int. Cl. H01h *1/66*

U.S. Cl. 200—168 G **5 Claims**



A sealed case housing, a switch blade and associated fixed contact terminals, an actuator end within the case, and a stationary rod providing a support for the case. The stationary rod extends parallel to the normal plane of the switch blade and coplanar to the actuator, which in turn is axially movable through the case relative to the support rod and longitudinally of the switch blade for actuation thereof upon movement in either direction.

3,678,236

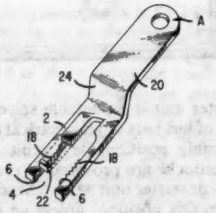
SWITCH HOLDER AND GUARD

Hugh S. Hughes, 6 Balanced Rock Terrace, Sparta, N.J.

Filed April 23, 1971, Ser. No. 136,894

Int. Cl. H01h *9/20*

U.S. Cl. 200—169 PB **10 Claims**



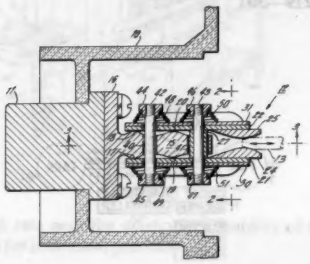
A hold down and guard device for a push button switch, secured to a support by mounting means through which the push button projects. The hold down and guard device has a body presenting surfaces engageable with complementary surfaces on the mounting means for the switch to hold the device in a fixed position with respect to the push button and switch and has a further portion which is fixed with respect to the body and projects over the push button to hold the button depressed or to prevent it from being unintentionally or accidentally depressed. The device may consist of a single unitary element such as a metal stamping or may be provided with means on the further portion thereof movable with respect to the body into a position to actuate the switch.

3,678,237

SELF-ALIGNING JAW CONTACT

Frank J. Rickert, Philadelphia, and Frank J. Pokorny, Hatboro, both of Pa., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Jan. 18, 1971, Ser. No. 107,057
Int. Cl. H01n 1/48, 1/50
U.S. Cl. 200—166 E 6 Claims



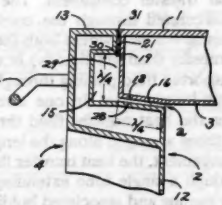
A jaw contact for receiving a relatively movable contact blade. The jaw contact consists of two elongated contact members supported on the opposite sides of a stationary support and are connected to the stationary support through two spaced pivots and contact points which are spaced from one another in the direction of elongation of the contact members. Biasing forces are applied to the side members at two axially spaced locations; one between the spaced pivot points; and the second being on the opposite side of the pivot point adjacent the jaw contact opening.

3,678,238

HIGH FREQUENCY HEATING APPARATUS

Yoshio Yasuoka, Osaka, and Yoshiaki Shirakami, Otsu, both of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi-shi, Osaka-fu, Japan

Filed Jan. 27, 1971, Ser. No. 110,009
Claims priority, application Japan, April 23, 1970, 45/35211
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 13 Claims



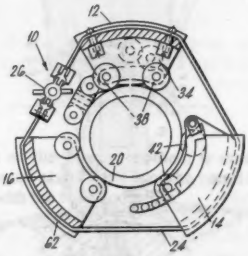
A high frequency heating apparatus, such as an oven, using microwave energy having an enclosure with an opening into the heating cavity which is to be sealed by the door. Peripheral metallic surfaces of the enclosure surrounding the opening and the door are spaced apart to leave a gap when the door is closed, the surfaces defining a parallel plate transmission line. The gap includes a first narrow portion of a quarter wavelength of the frequency of the energy from the heating source originating from an origin, which is the closest point to the entry into the heating cavity, which origin point serves as the input to the transmission line. A wide gap portion of a quarter wavelength has one end located adjacent the first narrow gap and a second narrow gap portion is located adjacent the other end of the wide gap portion. The second narrow gap portion is of a length less than a quarter wavelength long and is the output point of the transmission line. Due to the step down ratio of the transmission line the input point at the first narrow gap portion has a relatively low impedance which prevents energy from leaking out of the cavity.

3,678,239

INERT GAS SHIELDED ARC WELDING TORCHES

William G. Hill, London, England, assignor to Foster Wheeler Corporation, Livingston, N.J.

Filed April 20, 1970, Ser. No. 29,907
Claims priority, application Great Britain, April 21, 1969, 20,310/69
Int. Cl. B23k 9/02
U.S. Cl. 219—60 A 3 Claims



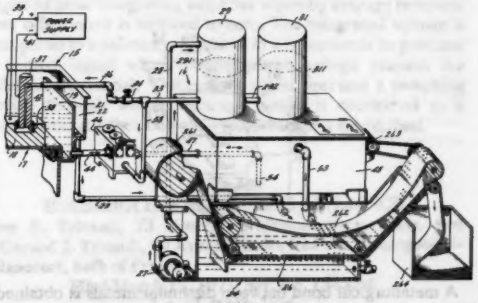
This invention describes an inert gas shielded electric arc welding torch for butt-welding tubes or tubular members of a wide range of outside diameters. The torch comprises a number of trolleys which are linked together and are spaced around the periphery of one tube. At least one trolley is provided with drive means and at least one trolley is produced with a welding head for making the butt-weld. All trolleys are constrained to follow a desired path by engagement with a track fitted around at least one tube. The torch is adjustable to suit differing sizes of tube or tubular member by altering the number of trolleys and/or by adjusting the spacing between them.

3,678,240

FLUID HANDLING SYSTEM FOR ELECTRICAL DISCHARGE MACHINING EQUIPMENT

Gerald P. Dietrick, 523 Ridgeview Drive, Florence, Ky.

Filed Feb. 24, 1971, Ser. No. 118,316
Int. Cl. B23p 1/08
U.S. Cl. 219—69 D 5 Claims



Electrical discharge machining equipment including a worktable reservoir tank, a fluid storage and settling tank and a source of clean fluid under pressure. Clean fluid under pressure is directed to a gap between an electrode and a workpiece in the reservoir tank during machining, Fluid is pumped

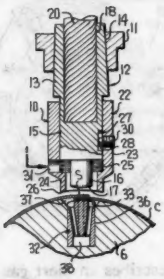
between the tanks by a jet pump. Clean fluid under pressure powers the jet pump. A side arm of the jet pump can be connected to each of the tanks alternately to draw fluid therefrom. The discharge of the jet pump is connected to the other tank to discharge into the other tank.

3,678,241

INERT ATMOSPHERE TACK WELDER

Paul M. Erlandson, Palos Park; Anton A. Aschberger, Oak Lawn, and John T. Cary, Markham, all of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed July 31, 1970, Ser. No. 59,932
Int. Cl. B23k 9/16, 35/38
U.S. Cl. 219—72 14 Claims



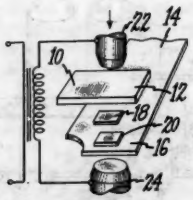
This disclosure relates to spot resistance welding or tack welding of edge portions of sheet material, particularly the welding of seams of containers. Means are provided for effecting gaseous flow around each of a pair of opposed electrodes with the flowing gas being preferably an inert gas and the flow being selectively one of pressure to one electrode and vacuum or partial vacuum to the other or pressure flow to both electrodes. Inert gas flow between the sheet portions being welded is also obtained.

3,678,242

METALLURGICAL BONDING OF DISSIMILAR METALS

Moreland P. Bennett, Pittsfield, Mass., assignor to General Electric Company

Division of Ser. No. 681,458, Nov. 8, 1967, Pat. No. 3,551,998. This application April 27, 1970, Ser. No. 43,279
Int. Cl. B23k 9/00
U.S. Cl. 219—118 3 Claims



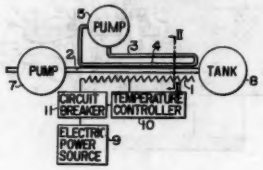
A metallurgical bond between dissimilar metals is obtained by using compatible shims between the metal members which will form a metallurgical bond to each other and to the dissimilar metals. Where copper and aluminum are the metals, a copper-silver-phosphorus shim and silver shim are used. A tin shim may be used between the copper-silver-phosphorus shim and the silver shim to improve their bonding characteristics. Heat and pressure are used to form the bond.

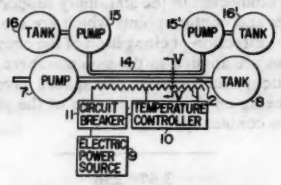
3,678,243

METHOD FOR LEVELLING THE TEMPERATURE OF AN ELECTRICALLY HEATED PIPELINE

Masao Ando, Yokohamashi, and Masao Hori, Toyko, both of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Dec. 16, 1970, Ser. No. 98,713
Claims priority, application Japan, Dec. 27, 1969, 45/1565; Nov. 18, 1970, 45/101714
Int. Cl. H05b 1/00; F17d 1/18; F28d 15/00
U.S. Cl. 219—301 4 Claims





A method for minimizing temperature gradients in a fluid being transported through an elongated electrically heated pipeline comprises the independent circulation of a heat transfer fluid through at least one tracing tube arranged either internally or externally along the length of the pipeline simultaneously with the application of electrical energy to the pipeline to heat the transported fluid. The heat transfer fluid has a high heat transfer coefficient. The quantity of heat transfer fluid circulated through the tracing tubes is small (about 1 percent in the case where both the transported fluid and the heat transfer fluid are liquids) in comparison to the amount of transported fluid passing through the pipeline on a volume per unit length basis. In one arrangement a single pump circulates the heat transfer fluid through serially connected tracing tubes arranged along the length of the pipeline. In another arrangement, the heat transfer fluid is reciprocated alternately through a single tube extending longitudinally of the pipeline by pumps and associated holding tanks arranged at both ends of the tube.

3,678,244

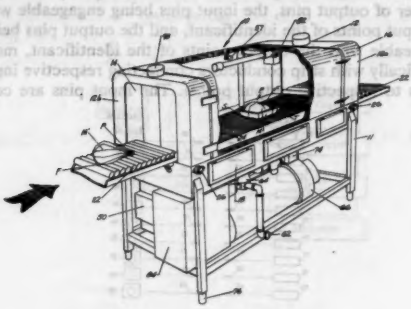
FILM SHRINKING TUNNEL UTILIZING HOT AIR AND WATER AS HEAT TRANSFER MEDIUM

Paul W. Worline, 125 Midway Road, Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 24,499, April 1, 1970, abandoned. This application June 18, 1971, Ser. No. 154,412
Int. Cl. F27b 9/06; F27d 11/02
U.S. Cl. 219—388 11 Claims

An apparatus for shrinking the film around packaged food products such as meats, cheeses and the like, which utilizes a combination of hot oven air and water as a heat transfer medium to the packaged food products by completely surrounding

the products with a hot wet mist cloud, at a carefully controlled temperature, so as to produce an ideal condition for effecting a shrink rate near the maximum capability of the film and best suited for individual products.



3,678,245

DEVICE FOR CLEANING THE WALLS OF THE MUFFLE CHAMBER OF BAKING AND ROASTING OVENS

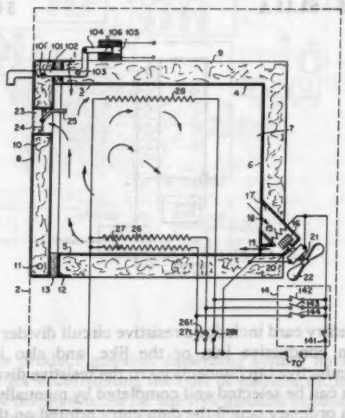
Joseph Ackermann, Traunreut, Germany, assignor to Siemens Elektrogerate GmbH, Berlin and Munich, Germany

Continuation-in-part of Ser. No. 843,947, June 20, 1969, abandoned. This application Nov. 27, 1970, Ser. No. 93,364

Claims priority, application Germany, July 21, 1968, P 17 78 938.7

Int. Cl. F27d *11/02*; A21b *1/22*

U.S. Cl. 219—396 **2 Claims**



Device for cleaning the walls of the muffle chamber of an oven with heated atmosphere circulating in a closed system includes means for passing heated atmosphere into the muffle chamber through an outlet located in a side wall of the muffle chamber adjacent the bottom wall of the same.

3,678,246

LIQUID HEATING VESSEL

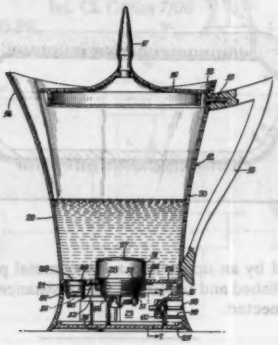
Donald L. Blachly, Glendale, and Jack E. Weidner, Fox Point, both of Wis., assignors to John Oster Manufacturing Co., Milwaukee, Wis.

Filed June 24, 1970, Ser. No. 48,978

Int. Cl. F27d *11/02*

U.S. Cl. 219—437 **15 Claims**

An appliance for heating a quantity of liquid in a molded plastic vessel with a heating element cast into a lug which extends upwardly into the water containing portion of the vessel.



The energization of the heating element is controlled by a thermostat positioned at the bottom of the vessel in good heat transfer relation with the vessel contents.

3,678,247

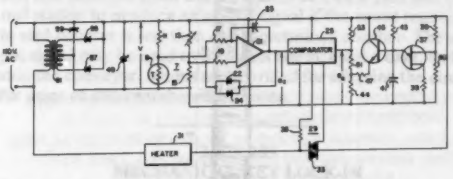
TEMPERATURE CONTROL CIRCUIT WITH ZERO AVERAGE TEMPERATURE OFFSET ERROR

Kenneth B. Sawa, Yorba Linda, and Thomas M. Bleak, Whittier, both of Calif., assignors to Beckman Instruments, Inc.

Filed April 19, 1971, Ser. No. 135,043

Int. Cl. H05b *1/02*

U.S. Cl. 219—501 **2 Claims**



A temperature sensing circuit generates a voltage proportional to the difference between a controlled temperature and a predetermined reference temperature. The voltage is integrated in an integrating amplifier whereby average temperature offset error is reduced to zero. The integrated voltage is compared to a reference potential in a comparator to generate a control signal when the integrated voltage exceeds the reference potential. The control signal operates a switching device through which electrical power is conducted to a heater whereby the controlled temperature is established.

3,678,248

HOUSEHOLD DISH-HEATING APPLIANCE

Yves P. Tricault, 23 Boulevard Montmorency, Paris, and Gerard J. Tricault, 90 Avenue Andre Morizet, Boulogne-Billancourt, both of France

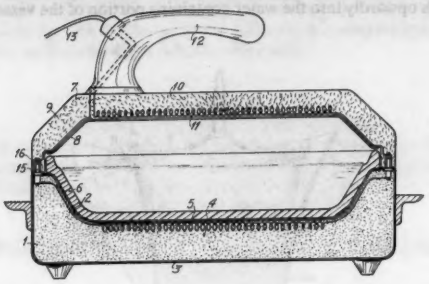
Filed March 15, 1971, Ser. No. 124,064

Int. Cl. H05b *3/06*

U.S. Cl. 219—525 **7 Claims**

A food heating appliance comprising a base in bowl form and a lid fitting the shape of one or several dishes to be heated. The base consists of a body of refractory material in which a first heating electrical resistance is embedded; this body is bounded by two metal plates; the lid, fitting over the base and

dish or dishes, is also made of a body of refractory material in which a second heating electrical resistance is embedded and



is bounded by an upper and a lower metal plate. The lower plate is polished and reflective. The resistances are preferably series-connected.

3,678,249

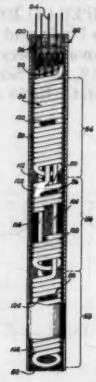
HEATER ELEMENT

Thomas H. Lennox, Topak, Ariz., assignor to Arc-O-Vec, Inc., Stanton, Calif.

Filed Oct. 21, 1970, Ser. No. 82,654

Int. Cl. H05b *3/44, 3/50*

U.S. Cl. 219—544 **11 Claims**



An electrical resistance heater is disclosed in an elongated tubular form wherein at least one resistance heating unit is coiled within a tubular housing. The resistance heating units include a coiled metallic sheath containing an internally coiled resistance wire that is fixed in the sheath by a mass of magnesium oxide. The heating units are similarly fixed in the tubular housing. Heating units coiled with a variable pitch and plural heating units of different characteristics are disclosed to accomplish different heat zones within the apparatus.

3,678,250

IDENTIFICATION SWITCH

Jurgen Dethloff, Hamburg, and Helmut Grottrup, Munich, both of Germany, assignors to Interlectron Patentverwaltung GmbH, Munich, Germany

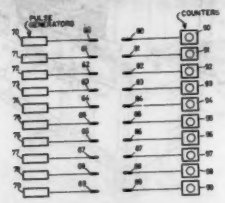
Filed Sept. 15, 1969, Ser. No. 857,957

Claims priority, application Austria, Sept. 13, 1968, 8917/68

Int. Cl. G06k *7/04;* **G07f** *7/00;* **H04q** *1/02*

U.S. Cl. 235—61.11 R **4 Claims**

An identificant is insertable into an identificator, and carries a number of input points and a number of output points, certain of the input points being connected with certain of the output points in accordance with a predetermined code. The code does not use binary logic but rather a translation logic. The identificator comprises a number of input pins and a number of output pins, the input pins being engageable with the input points of the identificant, and the output pins being engageable with the output points of the identificant, more specifically with strip conductors connecting respective input points to respective output points. The input pins are con-



nected to respective pulse generators, and the output pins are connected to respective counters. The pulse generators supply a pulse sequence in which the number of pulses in a group increases by one during the sequence of checking the input points and the output points, whereby each of the counters will contain only one respective number. The identificant may be provided with a monolithic semiconductor circuit, preferably on a head at its inner end, and capable of checking with respect to counterfeiting of the identificant.

3,678,251

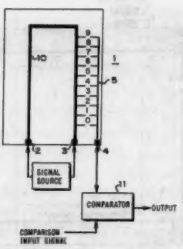
ANALOG ENTRY DATA CARD FOR GAME SCORING, OR THE LIKE, AND METHOD OF USING THE SAME

Frank H. Delpino, 11020 Stelling Road, Cupertino, Calif.

Filed March 4, 1971, Ser. No. 120,984

Int. Cl. G06k *7/06, 19/00*

U.S. Cl. 235—61.11 A **5 Claims**



A data-entry card includes a resistive circuit divider formed thereon in conductive ink, or the like, and also includes several conductive tap connections to the resistive divider circuit which can be selected and completed by manually underlining with ordinary pencil the data entry printed on the card. A card-receiving device including comparator circuits may be used to determine signal levels and hence representative data being entered by way of underlined entries on the data card.

3,678,252

PULSE ANALYZER

Roy David Payne, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 28, 1970, Ser. No. 58,832

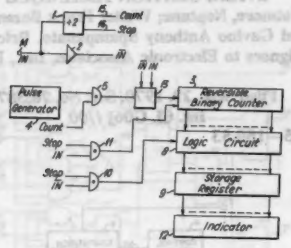
Claims priority, application Great Britain, Aug. 1, 1969, 38,734/69

Int. Cl. H03k *21/02*

U.S. Cl. 235—92 EV **6 Claims**

A system for taking the difference between the duration of a pulse, and the time between pulses including a reversible bi-

nary counter to count up during one interval and to count down during a succeeding interval. The count at the end of the



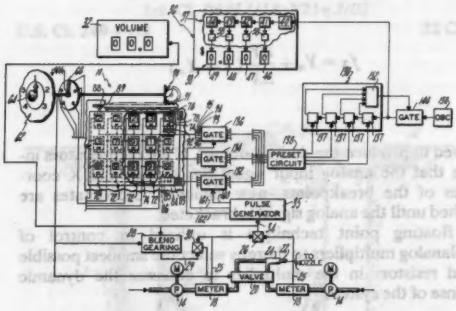
succeeding interval is transferred to a binary digital storage register by a set of gates. The output of the storage register is then impressed upon an indicator.

3,678,253

COMPUTING DEVICE

Reed H. Johnston, Wellesley, Mass., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed Aug. 17, 1970, Ser. No. 64,337
Int. Cl. H03k 21/36
U.S. Cl. 235—92 FL **19 Claims**



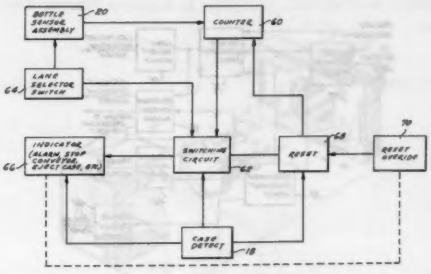
A five product gasoline dispensing system having a cost counter for accumulating the cost of gasoline dispensed, five banks of price switches for the five gasoline products respectively settable for pre-establishing the amount of each place of the unit volume price for the respective product within a three place price range, a selector for selectively conditioning the system for dispensing each of the gasoline products and for activating the corresponding switch bank for establishing the unit volume price, and a pulse generating device adapted to generate pulse trains for the three places of the unit volume price having 5, 50, and 500 pulses respectively for each unit volume of a gasoline dispensed. A control circuit is operated by each pulse to preset a binary predetermining counter at the binary complement of the setting of the respective price switch and an oscillator is gated to index the predetermining counter from its preset count to a maximum count and simultaneously index the cost counter such that for each unit volume of gasoline dispensed the amounts of the three places of the established price are added to the cost counter 5, 50, and 500 times.

3,678,254

MISSING CONTAINER DETECTOR

William R. Graff, Lynchburg, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Filed Nov. 18, 1970, Ser. No. 90,620
Int. Cl. G06m 7/00
U.S. Cl. 235—92 PK **30 Claims**



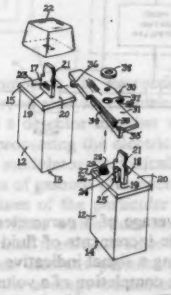
A control apparatus for a missing container detector comprises a photoelectric cell mounted on a suitable frame at a control station along a conveyor belt for sensing the presence of a case at said control station, a plurality of container sensing heads, one for each lane, mounted above the conveyor belt and adapted to sense individual containers as they pass thereunder, and a control circuit for indicating when a case is missing one or more containers. The control circuit comprises a binary counter responsive to proximity switches associated with said sensing heads and effective to register a count for each full row of containers which passes under said sensing heads and means operatively connected to said photoelectric cell and effective upon the movement of a case past said control station to produce an output signal if the count registered in said counter is less than a predetermined number. The output signal may be used to sound an alarm, eject a case, and/or stop the conveyor. Means are provided for adapting the circuit for cases of different shapes and sizes.

3,678,255

MECHANICAL KEY LOCK-IN

Eric L. Long, Waukegan, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed June 18, 1971, Ser. No. 154,459
Int. Cl. G06c 7/04
U.S. Cl. 235—145 R **6 Claims**

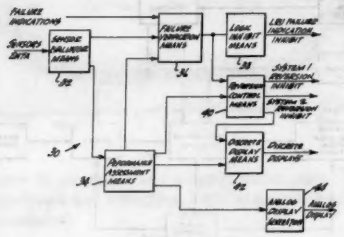


A mechanical lock-in for a depressed key of a keyboard including an automatic release of the locked depressed key through successive actuation of associated key members.

3,678,256
PERFORMANCE AND FAILURE ASSESSMENT MONITOR

Harold L. Harenberg, Jr., Long Beach, Calif., assignor to McDonnell Douglas Corporation

Filed Oct. 5, 1970, Ser. No. 78,073
Int. Cl. G06g 7/78
U.S. Cl. 235—150.2 30 Claims

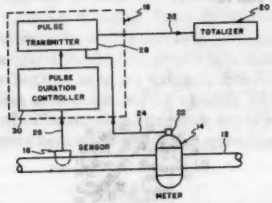


A performance and failure assessment monitor which assesses overall performance of the operation of the automatic landing mode of a flight control system for an aircraft. The monitor is connected to various sensors throughout the aircraft so that it can compare what the flight control system of the aircraft is accomplishing during a landing maneuver against an independent model generated within the monitor of what the flight control system should be accomplishing. The resultant comparison is displayed to the pilot as a measure of relative confidence that the landing will be accomplished properly. The monitor also includes failure verification and failure reversion control for making immediate and accurate assessments of the consequence of a failure of any component in the aircraft which in anyway affects the ability of the flight control and flight guidance instrument systems to operate properly, for correcting the failure when possible and for displaying only the critical failure information to the pilot of the aircraft.

3,678,257
METHOD AND APPARATUS FOR DETERMINING THE VOLUMETRIC AVERAGE OF A PARAMETER

G. C. Lilley, Houston, and Robert Herrick Kolb, Cypress, both of Tex., assignors to Shell Oil Company, New York, N.Y.

Filed June 17, 1970, Ser. No. 47,060
Int. Cl. G01f 1/00; G06f 7/38
U.S. Cl. 235—151.34 9 Claims

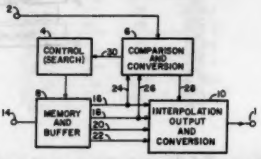


The volumetric average of a parameter is determined by measuring volumetric increments of fluid passing through a conduit and producing a signal indicative of the value of the parameter only upon completion of a volume increment. The signal is summed. The summed signal is proportional to volume times the parameter. The summed signal is divided by the number of volume increments to provide the volumetric average of the parameter.

3,678,258
DIGITALLY CONTROLLED ELECTRONIC FUNCTION GENERATOR UTILIZING A BREAKPOINT INTERPOLATION TECHNIQUE

James R. Patmore, Neptune; Walter Frank Bozenhard, Eatontown, and Gavino Anthony Spampanato, Bricktown, all of N.J., assignors to Electronic Associates, Inc., Long Branch, N.J.

Filed Sept. 29, 1970, Ser. No. 76,387
Int. Cl. G06j 1/00
U.S. Cl. 235—150.53 6 Claims



The specification discloses a digitally controlled function generator wherein breakpoint information for a given function is developed by a digital computer. A search function is employed by comparing the value of the analog input with the values of two adjacent breakpoints to ascertain whether the analog input is between the X coordinates of the breakpoints. If the comparison indicates that the value of the analog input is within the breakpoints, the corresponding Y coordinate values are removed from a memory and the interpolation equation

$$fx = Y_n + \frac{\Delta Y}{\Delta X}(X - X_n)$$

is solved to produce the desired output. If the comparators indicate that the analog input signal lies outside the X coordinates of the breakpoints, new values X coordinates are searched until the analog signal is bracketed.

A floating point technique is utilized in control of digitalanalog multipliers to thereby select the smallest possible valued resistors in the multiplier to enhance the dynamic response of the system.

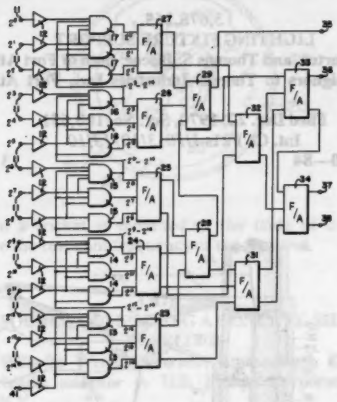
3,678,259
ASYNCHRONOUS LOGIC FOR DETERMINING NUMBER OF LEADING ZEROS IN A DIGITAL WORD

Leslie T. Kyser, Binghamton, N.Y., assignor to The Singer Company, New York, N.Y.

Filed July 28, 1970, Ser. No. 58,862
Int. Cl. G06f 7/38
U.S. Cl. 235—156 4 Claims

This invention relates to an asynchronous device for counting the number of consecutive leading zeros, starting with the most significant digit, in a digital word. Such a device is useful in generating shift and exponent modification information in floating-point digital computers and in generating information for overflow detection in fixed-point digital computers. The device comprises a plurality of gates, one for each digit in the binary word, which are so interconnected that they pass information only when the particular digit signal applied thereto is a zero and only when all of the higher order (more significant) digits are also zeros. The outputs of the gates are applied to a plurality of adders where they are counted, and the total is

presented at the output. The total can than be used to control a shifter for properly locating the binary point in the word, and



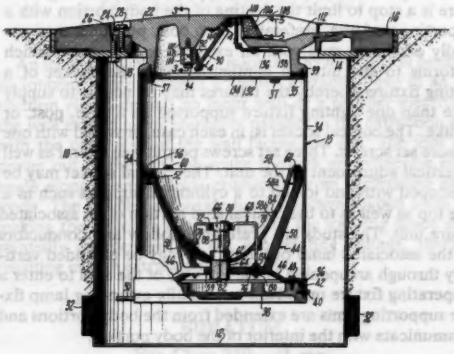
to provide information for exponent modification, or to provide information for overflow detection.

3,678,260

OPTICAL SYSTEM FOR AIRCRAFT GUIDANCE LIGHT

Edward W. Beal, Wethersfield, Conn., assignor to Connecticut International Corporation, Windsor Locks, Conn.

Filed Feb. 6, 1970, Ser. No. 9,309
Int. Cl. B64f 1/18; F21q 3/02
U.S. Cl. 240—1.2 22 Claims



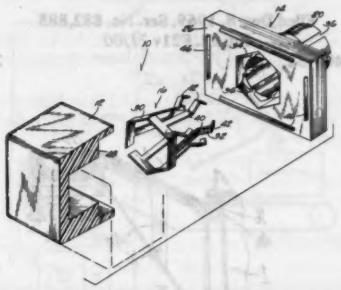
An aircraft guidance light having a reflector formed of a plurality of elliptical surfaces of revolution of different eccentricities about a common major axis are joined together at their common diameters in planes perpendicular to the axis and are displaced axially relative to each other to reflect light in the same general direction. The elliptical surfaces have a common focus and the elliptical surface of least eccentricity is nearest the common focus. A mirror is disposed at an acute angle to the common axis between the conjugate foci of the elliptical surfaces to capture and reflect the light through a side exit window in the hermetic housing of the light which contains a non-oxidizing gas at a positive pressure.

3,678,261

LENS ASSEMBLY FOR INDICATOR LIGHTS

Daniel E. McNeil, Broomall, Pa., assignor to Controls Switch, Inc., Folcroft, Pa.

Filed March 22, 1971, Ser. No. 126,505
Int. Cl. F21v 17/00
U.S. Cl. 240—151 4 Claims



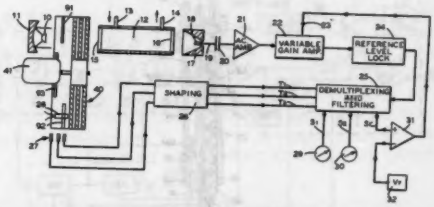
The lamp holder includes a collar which is captured in a groove provided in the reflector section of a lamp housing by a cup-shaped lens overlying and bonded, preferably ultrasonically, to the reflector section. Spring fingers extending from the collar of the lamp holder fit into slots provided in a barrel section of the lamp housing. The spring fingers have multiple bends forming two knee-like portions, one adapted to hold an indicator lamp and the other extending through slots provided in the barrel section, when an indicator lamp is installed. The latter knee-like portion engages the inside surface of the casing into which the lens assembly is installed and establishes electrical contact between the lamp and the casing.

3,678,262

INFRARED GAS ANALYZER

Pierre Herrmann, Hauts de Seine, France, assignor to Compteurs Schlumberger, Montrouge, France

Filed April 30, 1971, Ser. No. 138,876
Claims priority, application France, July 21, 1970, 7026755
Int. Cl. G01n 21/26
U.S. Cl. 250—43.5 R 18 Claims



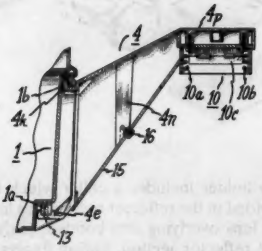
The analyzer comprises, in succession, an infrared ray source, a modulator, an analysis chamber containing the mixture of gasses, and a detector together with associated electronic circuits for processing the electric signals delivered by the detector. The modulator periodically interposes in the path of the radiation of gaseous reference filter which absorbs the characteristic lines of the particular gas to be analyzed, and a measurement filter which does not absorb these lines. The filters are separated from each other by two identical base filters comprising an element permitting grey transmission slightly lower than the average transmission of the reference filter so that the detector delivers successively a measurement signal and a reference signal respectively defined with respect to a common level determined by the base filters. The electronic processing circuits comprise means for amplifying and

demultiplexing the signals and means for establishing and reading out the quotient of the measurement signal and the reference signal. This quotient is representative of only the concentration sought.

3,678,263
LIGHTING ASSEMBLY DEVICE

Mitchell M. Osteen, Zirconia, and James L. Grindle, Hendersonville, both of N.C., assignors to General Electric Company

Filed Dec. 8, 1969, Ser. No. 882,885
Int. Cl. F21v *21/00*
U.S. Cl. 240—52 **2 Claims**

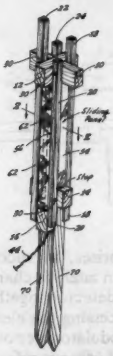


Industrial luminaire has a single ballast housing and a plurality of detachable lateral mounting arms for mounting a desired number of optical assemblies on the ballast housing. Each mounting arm is formed at one end for selective attachment to any of the ballast housing sides and has a support device at the other end for detachably hanging an optical assembly.

3,678,264
ELECTRIC LAMP

Jon F. Myhre, 3500 Anette Street, Los Angeles, Calif.

Filed Nov. 16, 1970, Ser. No. 89,545
Int. Cl. F21s *1/10*
U.S. Cl. 240—84 **5 Claims**

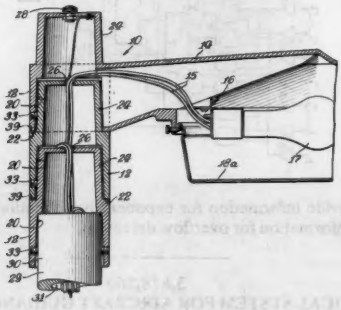


An improved electric lamp assembly is provided which is particularly suited for outdoor use as an outdoor lantern. The electric lamp has a unique configuration, being composed in one embodiment of transverse members forming the top and bottom for the lamp and four side posts extending between the top and bottom, with translucent plastic panels mounted in the side posts. At least one of the plastic panels is slidable in the side posts to an open position so as to permit access to the interior of the lamp assembly for inserting and replacing an electric light bulb within the assembly.

3,678,265
LIGHTING FIXTURE SUPPORT

David H. Porter, and Thomas S. Biscoe, both of Fort Atkinson, Wis., assignors to Thomas Industries Inc., Fort Atkinson, Wis.

Filed Dec. 22, 1970, Ser. No. 100,651
Int. Cl. F21s *1/10, 3/10, 13/10*
U.S. Cl. 240—84 **13 Claims**



The lighting fixture is adapted to be supported on a pole, or post top or the like and has a generally cylindrical body portion or hub portion from which extends laterally one or more arms. The arms carry the necessary lamp supporting means and wires thereto. The body portion in the preferred form has a downwardly opening tapered socket, preferably conical, which may be nested with and supported on a mating stud. There is a stop to limit the nesting of the body portion with a supporting stud and, preferably, each body portion has an upwardly extending stud with an external configuration which conforms to the internal configuration of the socket of a lighting fixture whereby the fixtures may be nested to supply more than one lighting fixture supported on a pole, post, or the like. The conical socket is, in each case, provided with one or more set screws. Three set screws permit free lateral as well as vertical adjustment of the unit. The conical socket may be telescoped with and joined to a cylindrical support such as a pole top as well as to the conical stud portion of an associated fixture unit. The studs are preferably hollow and conductors for the associated lamp or lamps and may be extended vertically through an opening in the top wall of the stud to enter a cooperating fixture unit. Hollow laterally extending lamp fixture supporting arms are extended from the body portions and communicate with the interior of the body portion.

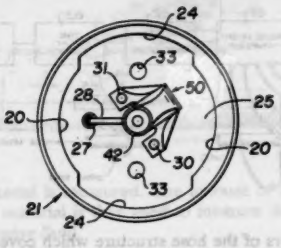
3,678,266
APPARATUS FOR INCANDESCENT FILAMENT MOUNTING

Joseph J. Fradette, Cleveland, Ohio, assignor to White Motor Corporation

Division of Ser. No. 639,124, May 17, 1967, Pat. No. 3,484,600. This application Nov. 21, 1969, Ser. No. 878,690. The portion of the term of this patent subsequent to Dec. 16, 1986, has been disclaimed.
Int. Cl. F21v *15/04*
U.S. Cl. 240—90 **5 Claims**

Automotive vehicle equipped with incandescent lamp filament mounting which isolates the filament from vibrations at the resonant frequency of the filament, thereby extending the

life of the filament. The frequency isolation is accomplished with an exponential spring. The spring is secured to a lamp



body and a socket is mounted at the node of frequencies which are the resonant frequency of the filament.

3,678,267

ION SOURCE COMPRISING A CONCAVE-SHAPED REPELLER

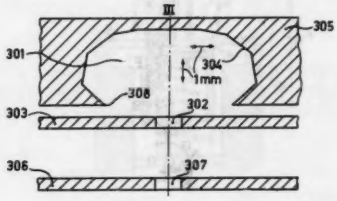
Helmut Wilhelm Werner Werner, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 17, 1969, Ser. No. 858,772

Claims priority, application Netherlands, Sept. 26, 1968, 6813748

Int. Cl. H01j *39/36*

U.S. Cl. 250—41.9 SB **2 Claims**



An ion source in which gas is ionized by an electron beam in an ionizing space between a narrow extraction gap in an extraction electrode and an inner wall of a repeller electrode; the wall extending substantially parallel to the extraction gap with the open side of the wall facing the gap. The ions are drawn out of the ionizing space through an extraction electrode along electric fields produced by an acclerating electrode. The repeller electrode has a concave-shaped form for making the effective electric field of the ionizing space substantially independent of the accelerating voltage, thereby resulting in high extraction efficiencies.

ERRATUM

For Class 250—43 see:
Patent No. 3,678,262

3,678,268

BULK DENSITY GAGE AND BULK DENSITY CONTROL SYSTEM

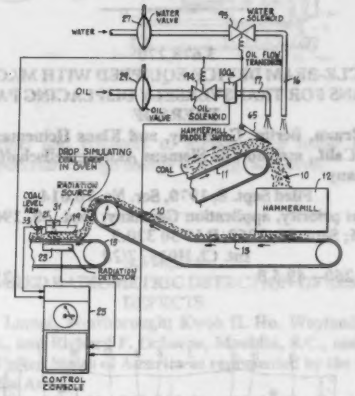
Thomas E. Reim, Willowick; Jerry J. Pollack, Brookpark, and Robert A. Kemmerling, Cleveland, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 720,057, April 10, 1968, abandoned. This application Nov. 5, 1970, Ser. No. 87,360

Int. Cl. G01t *1/17*; G01n *23/14*

U.S. Cl. 250—43.5 D **15 Claims**

The output of a radioactive source is directed through a moving stream of granular material, e.g., coal on a conveyor, and the radiation passing through is sensed by a detector. The detector generates a pulse signal of which the pulse repetition rate varies with the radiation sensed. The pulses generated are counted in a binary counter, and a timer periodically initiates a read-out of and resets the counter to effect successive counting cycles, whereupon the digital count in each cycle is converted to an analog voltage, the magnitude of which is



recorded in terms of bulk density of the coal. The recorder controls the addition of water or oil to the coal to, respectively, lower or increase the bulk density of the coal. Controls are included which guard the system from misperforming when a supply of coal has failed, when the depth of coal on the conveyor belt has been lost, and when the coal is so dense that an application of water is required.

3,678,269

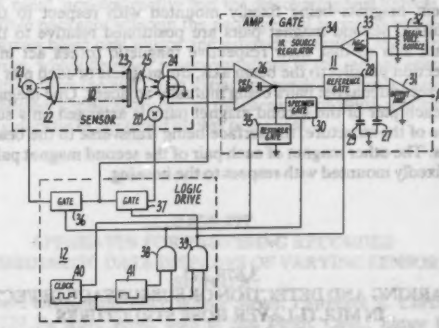
METHOD AND APPARATUS FOR MEASURING RADIATION ABSORPTION IN A FLUID SPECIMEN

Fritz J. Malek, Santa Barbara, Calif., assignor to Metrophysics, Inc.

Filed Nov. 23, 1970, Ser. No. 91,952

Int. Cl. G01n *21/34*

U.S. Cl. 250—43.5 R **6 Claims**



Method and apparatus for measuring the radiation absorption of a fluid specimen and more particularly wherein an electrical signal proportional to the radiant energy received through the fluid specimen is stored and compared with an electrical signal derived from a known reference source, the difference between the signals producing an output signal that is a measure of radiant energy absorbed by the fluid specimen. A pair of capacitors store the electrical signals for comparison and are connected alternately and intermittently to a radiation

sensing means by a first pair of gates. A second pair of gates alternately and intermittently energize a pair of radiant energy sources, one source being used as a reference and the other source emitting radiant energy that is transmitted through a specimen fluid undergoing measurement. Both pairs of gates are operated synchronously by a gating circuit that is controlled by a clock and a flip-flop circuit.

3,678,270

PARTICLE-BEAM DEVICE EQUIPPED WITH MAGNETIC MEANS FOR TRANSVERSELY DISPLACING PARTS THEREOF

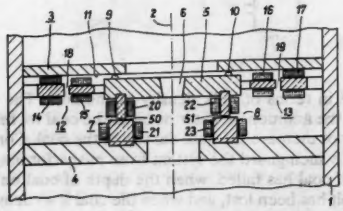
Dieter Braun, Berlin, Germany, and Klaus Heinemann, Palo Alto, Calif., assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 8, 1970, Ser. No. 70,014

Claims priority, application Germany, Sept. 30, 1969, P 19 50 327.6; Sept. 30, 1969, P 19 50 320.9

Int. Cl. H01J *37/20*

U.S. Cl. 250—49.5 B 21 Claims



A particle-beam device has a beam axis and a housing surrounding the axis wherein a moveable structure is disposed. An apparatus for moving the structure transverse to the beam axis has first magnet pairs disposed at opposite sides of the structure and positioned so that their respective magnetic forces act in a direction transverse to the beam axis. The two magnets of each pair of the first magnet pairs are mutually adjacent, one of the two adjacent magnets being arranged on the outer periphery of the structure and the other of two the adjacent magnets being fixedly mounted with respect to the housing. Second magnet pairs are positioned relative to the beam axis so that their respective magnetic forces act in a direction parallel to the beam axis, the magnets of each pair of the second magnet pairs being mutually adjacent. One magnet of each pair of the second magnet pairs is arranged on a surface of the structure, the surface being transverse to the beam axis. The other magnet of each pair of the second magnet pairs is fixedly mounted with respect to the housing.

3,678,271

MARKING AND DETECTION OF SUBSURFACE DEFECTS IN MULTI-LAYER HOSE STRUCTURES

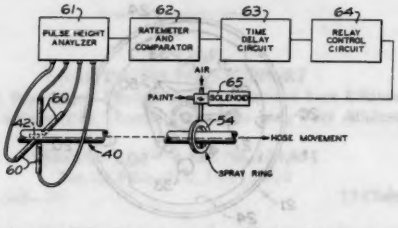
John J. Groezinger, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 9, 1969, Ser. No. 865,020

Int. Cl. G01t *1/20*

U.S. Cl. 250—71.5 R 7 Claims

Subsurface defects in multi-layer hose structures are marked as to location and extent with a tape having an axial stripe of radioactive salts thereon which is subsequently detected with scintillation counters that are connected to circuits and controls which mark or remove the faulty section of the hose structure after completion of the hose. The radioactivity of the salt is capable of being detected through the subsequent layers of the hose structure which cover the tape as the manufacture of the hose continues after the defect is coded with the tape.



3,678,272

SPECTROPHOSPHORIMETER

Jan Jasny, Baleya, Poland, assignor to Polska Akademia Nauk Instytut Chemii Fizycznej, Warszawa, Poland

Filed March 18, 1971, Ser. No. 125,525

Int. Cl. G01j *3/42*

U.S. Cl. 250—71 R 10 Claims

A spectrophosphorimeter is disclosed for defining the spectrum and the dephosphorescence function of solids and liquids wherein the matter to be tested is subjected to a zonal excitation and analysis. The spectrophosphorimeter comprises a prismatic or mirror system by which a transverse translation is obtained between the beam of excitation and the beam of received radiation to define an interval between the time of excitation and the time of analysis: The prismatic or mirror system is rotatable so that the beams travel along a circular path, the angular interval between the beams being regulated by adjusting the relative angular positions of the excitation system and the analyzing system with respect to the axis of rotation of the prismatic or mirror system.

3,678,273

METHOD OF MEASURING THE ABRASIVENESS OF AN ABRASIVE FLUID

Donald R. Lewis, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

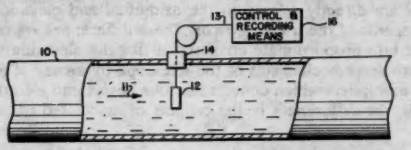
Filed Feb. 11, 1970, Ser. No. 10,545

Int. Cl. G01t *1/16*

U.S. Cl. 250—83 R 4 Claims

A method of measuring the abrasiveness of an abrasive fluid by exposing a radioactive abradable material to a flow of the abrasive fluid, and measuring the rate at which radiation is being emitted from the fluid-contacted radioactive abradable material. The decrease due to an abrading away of the

radioactive abradable material that occurs in the rate at which the radiation is emitted from the fluid-contacted radioactive

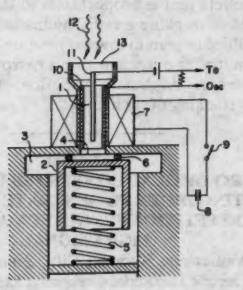


abradable material is measured. The amount of abrasion of the abradable material is then used to measure the abrasiveness of the abrasive fluid.

3,678,274
DIAPHRAGM-LESS RADIOACTIVE RADIATION COUNTER

Nobuki Kawashima, Tokyo, Japan, assignor to President of Tokyo University, Tokyo, Japan

Filed March 20, 1970, Ser. No. 21,380
Claims priority, application Japan, Oct. 29, 1969, 44/86061
Int. Cl. G01t *1/18*; H01j *39/26*
U.S. Cl. 250—83.6 R 5 Claims



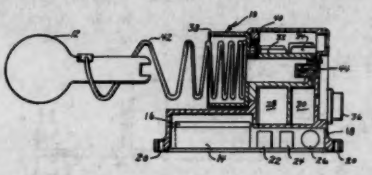
A radio-active radiation counter is provided with a counter chamber having a diaphragm-less open window, and two collecting electodes are disposed in said chamber and separated from each other. A gas to be ionized is injected in a pulse into the chamber intermittently to create a gas cloud for a short duration in the space where the electrodes are disposed, and a voltage pulse is applied across the electrodes during the presence of said gas cloud between the electrodes to operate the counter in order to measure the radiation coming into the chamber during the voltage being applied to the electrodes. Because of the absence of a diaphragm in the ray entrance window of the counter chamber, the absorption of radiation energy in a diaphragm is avoided and thereby it is possible to measure radiations of energy less than 1 Kev.

3,678,275
DOSIMETRY SYSTEM FOR MEASURING INSTANTANEOUS DOSE AND LINEAR ENERGY TRANSFER SPECTRUM OF SPACE RADIATIONS

Marion F. Schneider, and Edward L. Breen, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force

Filed April 15, 1971, Ser. No. 134,280
Int. Cl. G01t *1/02*, *1/18*
U.S. Cl. 250—83.6 R 2 Claims

A space radiation dosimetry system utilizing a portable ionization chamber mountable in a housing containing associated electronics and a linear energy transfer (LET) spectrometer with associated electronics. The LET spectrometer utilizes a pair of solid state detectors in combination with amplifiers, a discretionary number of discriminator channels,

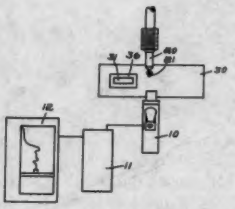


logic circuits and counters to measure the linear energy transfer spectrum of high energy ionizing radiations.

3,678,276
INFRARED RADIOMETRIC DETECTION OF SEAL DEFECTS

Rauno A. Lampi, Westborough; Kwoh H. Hu, Wayland, both of Mass., and Richard F. Osborne, Mauldin, S.C., assignors to The United States of America as represented by the Secretary of the Army

Continuation of Ser. No. 880,263, Nov. 26, 1969, abandoned.
This application July 1, 1971, Ser. No. 159,068
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 H 7 Claims



A rapid, non-destructive test for discovering seal defects in flexible packages wherein the package seal is passed between a narrow beam heat source and a detector sensitive to infrared energy, which detector senses variations in the radiant energy emitted from the seal, such variations resulting from a change in thermal conductivity due to the presence of voids, wrinkles, irregularities or occluded matter in the seal.

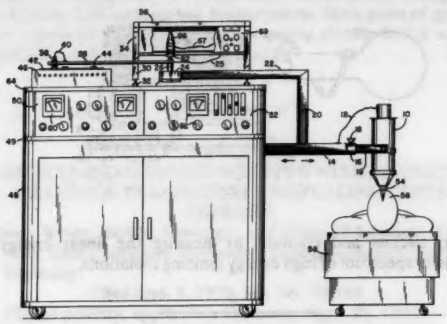
3,678,277
APPARATUS FOR PROVIDING RECORDED CHROMATIC DATA DISPLAYS OF VARYING SENSOR SIGNALS

Gilbert Greenspan, 2027 Willow Street; Lawrence R. Curtis, 2727 De Anza Road, both of San Diego, Calif.; Elmer E. Cunningham, 8051 Sterling Drive, El Cajon, Calif., and James G. Tabler, 2060 Chicago, San Diego, Calif.

Filed June 27, 1968, Ser. No. 740,640
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 R 5 Claims

A chromatic data display system for recording signals from any source on color paper, and particularly for recording varying pulse rate information on color paper that is representative of the distribution of radioactive material in, for example, a part of a human body, which pulse rate information is in

response to rectilinear scanning of that part of the human body or from the rescan of an image from a black and white



photoscan on X-ray or other film, and which image represents pulse rate information obtained from prior rectilinear scannings.

3,678,278

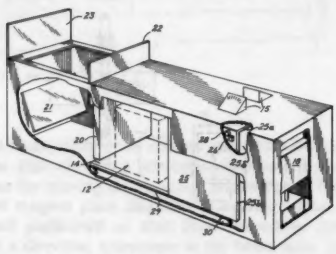
APPARATUS FOR BAGGAGE INSPECTION

Le Roy E. Peil, 1113 East Adams, Riverton, Wyo.

Filed Jan. 26, 1970, Ser. No. 5,538

Int. Cl. G21f *7/00*

U.S. Cl. 250—108 R **1 Claim**



An inspection apparatus for use with an airline ticket and check-in counter includes an X-ray and fluoroscopic examination unit and a frequency modulation monitor, all positioned on a frame adjacent a baggage weighing platform. A sliding X-ray impervious shield is supported on the frame and is positioned over the weighing platform and baggage thereon during the X-ray inspection.

3,678,279

AUTOMATIC VARIABLE GAIN OPTICAL TRACKER FOR SPACE VEHICLES COMPRISING D-C SYSTEM FOR ERROR SIGNAL GENERATION

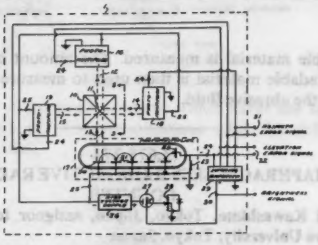
Louis S. Macknik, and Kenneth E. Kissell, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force

Filed June 2, 1970, Ser. No. 42,648

Int. Cl. G01j *1/20*; H01j *39/12*

U.S. Cl. 250—203 **1 Claim**

A tracker for optical targets that vary in brightness and size over a wide range and at a relatively high rate, such as may be presented, for example, by a tumbling body in space. A tracking telescope is provided with an optical device such as a pyramidal reflector or refractor having its apex at the focus of the telescope for splitting the target image into four beams 90 degrees apart. When the optical axis of the telescope is on the target the image is centered on the apex of the pyramid and the oppositely extending beams are equal. When there is a tracking error, the image is not centered on the apex and the differences in the light fluxes of the oppositely extending beams are directly related to the azimuthal and elevational components of the tracking error. These differences are converted into proportionate error signals for the elevation and azimuth servomechanisms of the telescope by means of four photomultipliers which convert the four beams into electrical signals, the differences in the outputs of associated pairs of



photomultipliers constituting the error signals. In addition, the outputs of the four photomultipliers are added to produce an instantaneously acting automatic gain control voltage for the photomultipliers that is proportional to target brightness and independent of tracking error. The instantaneous adjustment of photomultiplier gain in inverse relation to target brightness holds the multiplier outputs within a narrow range over a wide range of target brightness variation, thereby permitting satisfactory tracking of such targets.

3,678,280

ELECTRO-OPTICAL CONVERTER USING A PULSE GENERATING DIODE TO GENERATE SIGNAL HAVING PULSE REPETITION FREQUENCY ACCORDING TO LIGHT SIGNAL

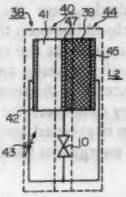
Sadahiko Yamashita, Kadoma City, Japan, assignor to Matsushita Electric Industrial Company, Limited, Kadoma City, Osaka, Japan

Filed Sept. 17, 1970, Ser. No. 73,051

Claims priority, application Japan, Sept. 20, 1969, 44/74822; Sept. 20, 1969, 44/75557

Int. Cl. H01j *31/50, 39/12*

U.S. Cl. 250—213 A **5 Claims**



An electro-optical converter comprising a first loop including in series a photoconductive element having a photoconductive body and a light permeable electrode mounted at one end of the body, a DC power source and a pulse generating diode, and a second loop including in series the pulse generating diode as a common element and an electroluminescent material having a light permeable electrode at one end thereof. The other ends of the photoconductive body and the electroluminescent material are made in electrical contact with each other. When the first loop oscillates with an input light signal being incident on the photoconductive body, the second loop is energized to emit an output light signal. The in-

tensity of this light signal depends upon that of the incident light and upon the bias voltage applied to the pulse generating diode by the DC power source. The pulse generating diode employed in this converter is a novel one having a p-N structure.

3,678,281

PHOTOELECTRIC SENSING DEVICE

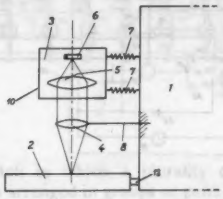
Franz Gleixner, Munich-Pasing, Germany, assignor to Firma Erwin Sick, Waldkirch i. Br., Germany

Filed March 31, 1970, Ser. No. 24,161

Claims priority, application Germany, April 2, 1969, P 19 17 139.2

Int. Cl. H01j *5/16*

U.S. Cl. 250—216 **4 Claims**



In a photoelectric sensing device a first lens is affixed to a machine at a distance equal to its focal length from an object under observation. A detector unit, including a second lens and a photoelectric detector in the focal point thereof is resiliently mounted on a machine, the second lens being aligned with the first lens. Thereby the object is imaged on the detector regardless of vibrations of the machine and, on the other hand, the detector unit is protected from such vibrations.

3,678,282

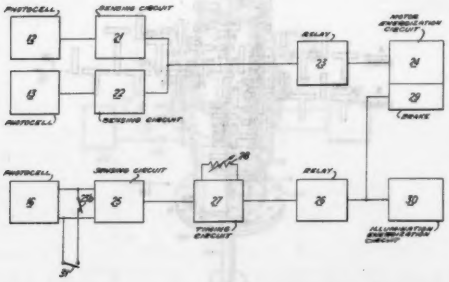
DISPLAY UNIT WITH RADIATION SENSITIVE CONTROL

Harold Hector Johnson, Ringwood; Derek Bye South, London, and Charles Victor Burdett White, Eastcote, all of England, assignors to Rotasign Limited

Filed June 15, 1970, Ser. No. 46,441

Int. Cl. G09f *11/00*

U.S. Cl. 250—219 FR **9 Claims**



A display unit comprises a box housing two spools between which a strip of film frames is wound past a window first in one direction and then in the other direction. Reversal of the direction of film drive is initiated by two photo-electric cell arrangements adapted to detect the approach of the end of the strip in each direction. As each individual frame registers with the window, the strip is stopped to display the frame for a predetermined period. The registering of a frame with the window is detected by a photo-electric cell arrangement detecting marks suitably distributed along an edge of the strip to correspond to the individual frames. The three photocells are connected in electrical control circuitry, each photocell being connected to the input of a respective Schmitt trigger circuit. The outputs of the Schmitt triggers associated with the direction reversing photo-cells are fed to a first relay operative to effect reversal of a motor driving the spools. The output of the other Schmitt trigger is fed via a timing circuit to a second relay operative to initiate rear illumination of a frame registered with the window and to cause the application of a brake to the motor. To ensure that the film strip is tensioned during its movement in either direction, in one embodiment of the invention each spool is driven through a retarder providing resistance to rotation in the direction applying when the strip is being unwound from that spool.

3,678,283

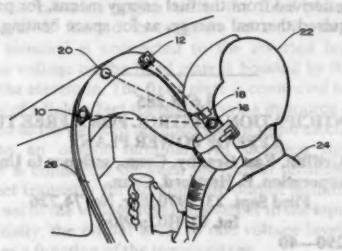
RADIATION SENSITIVE OPTICAL TRACKER

Kenneth B. LaBaw, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 22, 1970, Ser. No. 82,880

Int. Cl. H01j *3/14*

U.S. Cl. 250—216 **10 Claims**



An optical tracker system for determining the sight-line of a pilot within a cockpit. The system has at least two light sources and one photodetector mounted in the cockpit, and one light source and one photodetector mounted on the pilot's helmet. Electrical signals from the photodetectors uniquely establish the position and orientation of the pilot's helmet. When a helmet attached sight is included in the system the signals indicate the pilot's line-of-sight.

3,678,284

ENERGY SUPPLY APPARATUS AND METHOD FOR A BUILDING

Charles Michael Dansey Peters, 5 William Orchard Close, Old Headington, Oxford OX3 9DR, England

Continuation-in-part of Ser. No. 851,373, Aug. 19, 1969, abandoned. This application Sept. 15, 1970, Ser. No. 72,301

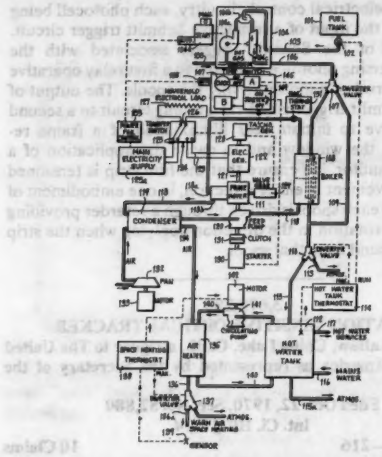
Claims priority, application Great Britain, Aug. 27, 1968, 40,969/68

Int. Cl. B60l *1/02*

U.S. Cl. 290—1 **9 Claims**

For supplying the electrical and thermal energy utilization systems of a residential or other building, means are provided for deriving energy from fuel, and an electrical generator driven by a prime mover that is energized by such fuel and that has provision for exhaust heat recovery is employed and arranged in association with electrical power from a conventional external source so that under coordinated control, e.g., automatically at certain times or conditions, the electrical generator is operated to supplant power from the external

source for at least a part of the electrical utilization system while heat recovered from the prime mover supplants heat



separately derived from the fuel energy means, for part or all of the required thermal energy, as for space heating and hot water.

3,678,285

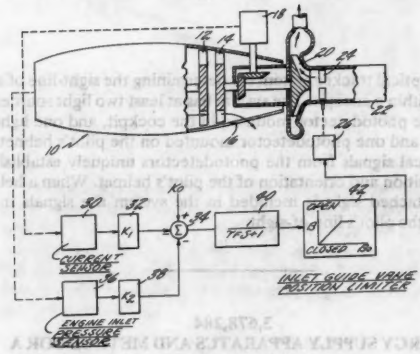
LOAD ANTICIPATION CONTROL FOR A FREE TURBINE TYPE OF POWER PLANT

James J. Griffith, East Granby, Conn., assignor to United Aircraft Corporation, E. Hartford, Conn.

Filed Sept. 23, 1970, Ser. No. 74,726

Int. Cl. H02p *9/04*

U.S. Cl. 290—40 **7 Claims**



The inlet guide vanes that adjust the pneumatic load of a compressor driven by the free turbine of a free turbine type power plant are positioned as a linear function of electrical load and inlet pressure.

3,678,286

AUTOMATIC LAMP CHANGER AND SPARE LAMP INDICATOR CIRCUIT

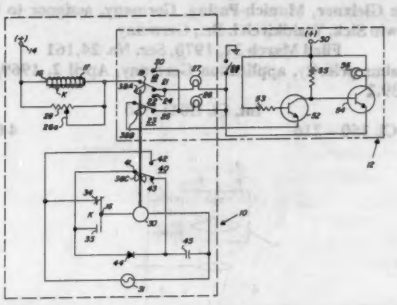
Roger L. Willis, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed March 22, 1971, Ser. No. 126,734

Int. Cl. H02j *1/00*

U.S. Cl. 307—38 **4 Claims**

A circuit for automatically energizing a spare or standby lamp in response to the burning out of the primary lamp and for continuously monitoring the spare lamp to verify operability thereof up to the time the burned-out lamp is replaced includes a source of electrical power, a relay and a two-position control switch connected such that the switch in one position connects one of the lamps in series with the power source and the relay and, in the other position connects the other of the lamps in series with the power source and the relay. A motor is



actuated in response to the burning out of the primary lamp to position the control switch so that the spare lamp replaces the burned out lamp in the series circuit. The spare lamp is continuously monitored by connecting a transistorized switching network from the spare lamp to a warning or indicator lamp. The output stage of the network is switched on, thereby energizing the warning lamp, if the spare lamp is or becomes defective.

3,678,287

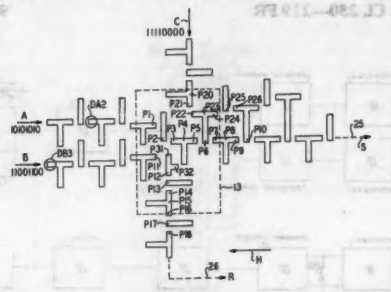
MAGNETIC DOMAIN LOGIC ARRANGEMENT

Woo Foung Chow, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 28, 1971, Ser. No. 147,854

Int. Cl. G11c *11/14, 19/00*; H03k *19/168*

U.S. Cl. 307—88 LC **5 Claims**

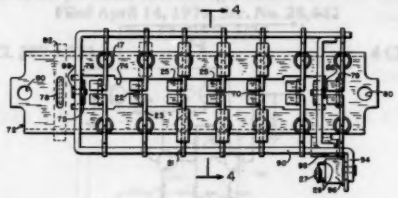


An overlay of magnetically soft material juxtaposed with a slice of a magnetic material in which single wall domains can be moved is of a geometry to define an intersection between two input and two output channels such that one of the output channels provides a logical OR function or a logical AND function depending on the presence or absence of a domain in a control channel while the other of the output channels simultaneously exhibits a logical AND function or a logical OR function, respectively.

3,678,288
MULTIPLE PUSH BUTTON SWITCH SPEED CONTROL SYSTEM

Roy L. Swanke, Newington, and Gordon H. Raymond, Southington, both of Conn., assignors to Dynamics Corporation of America, New York, N.Y.

Continuation-in-part of Ser. No. 766,280, Oct. 9, 1968, abandoned. This application Aug. 13, 1970, Ser. No. 63,511
Int. Cl. H01h *15/00*
U.S. Cl. 307—113 44 Claims

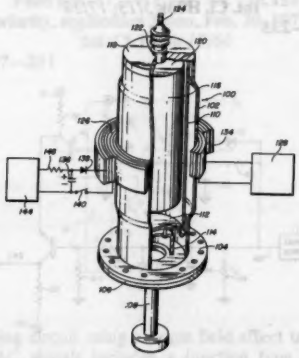


A multiple switch in which a plurality of individually operated actuators arranged in groups or pairs permute three switches in four patterns which are identical for the actuators of each pair. A two position switch serially connected therewith is oppositely actuated by the individual actuators of each pair to either an open or closed position and thereby provides two modes for each of the four permutations. Preferably, a serially connected switch actuated each time the switches are permuted is rated to make and break a high wattage current and the others are rated to handle a substantially lesser wattage, said permuted switches being timed sequentially to be either open or closed during the moment that the serially connected switch is being opened or closed.

3,678,289
MAGNETIC FIELD CONTROL CIRCUIT FOR CROSSED FIELD SWITCHING DEVICES

Michael A. Lutz, and Gunter A. G. Hofmann, both of Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 18, 1971, Ser. No. 172,719
Int. Cl. H01h *35/00*
U.S. Cl. 307—149 9 Claims

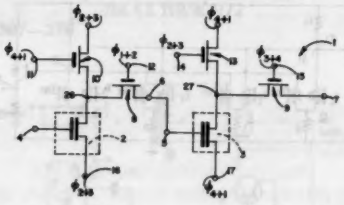


A conducting crossed-field switching device in a high voltage circuit can be offswitched by temporarily reducing the magnetic field to non-conductive conditions. While high voltage rises across the offswitching crossed-field device, the magnetic field strength-reducing pulse dissipates, but the conditions in the interelectrode space remain non-conductive.

3,678,290
RATIOLESS AND NON-INVERTING LOGIC CIRCUIT USING FIELD EFFECT BOOSTING DEVICES

Robert X. Booher, Mission Viejo, Calif., assignor to North American Rockwell Corporation

Filed May 23, 1969, Ser. No. 827,269
Int. Cl. H03k *19/08*
U.S. Cl. 307—205 5 Claims

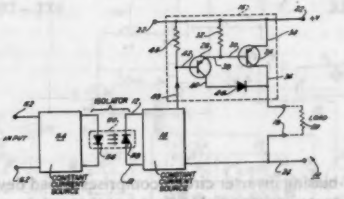


A non-inverting logic gate using a field effect device which includes a boosting capacitor having a fixed plate connected to an input terminal and its other plate comprising an inverted layer in the substrate region under the fixed plate. The inverted layer is formed in response to an input signal. A clocked terminal is connected to the inverted layer. As a result, the voltage on the fixed plate is boosted by the voltage level on the electrode. The fixed plate is connected to the gate electrode of a field effect transistor having its source electrode connected to the clocked terminal and its drain electrode connected to an output terminal. An isolation field effect transistor is connected between the output terminal and the field effect transistor for isolating the output terminal after it has been set to the voltage level equivalent to the input voltage level. Initially, the output is set to one voltage level which is changed as a function of the input voltage.

3,678,291
SOLID STATE RELAY

Ronald J. Coe, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Filed May 18, 1970, Ser. No. 38,471
Int. Cl. H02h *7/20*; H03k *3/26*
U.S. Cl. 307—202 11 Claims



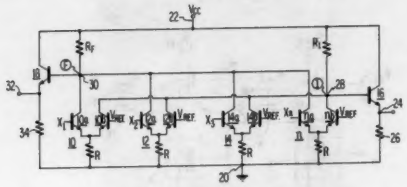
A solid-state switching device capable of replacing mechanical relays. When the relay is conducting rated load current, a single saturated transistor carries the current with a very low voltage drop. When the load current rises above a pre-determined level, the load-carrying circuit automatically becomes a modified Darlington circuit, which is capable of carrying substantial overloads without being damaged, and with voltage drops within a desirable range. Optionally, means are provided for disabling the load circuit and, in effect, opening the relay, when a certain level of overload current is reached, thereby turning the device into a circuit-breaker.

3,678,292

MULTI-FUNCTION LOGIC GATE CIRCUITS

Daniel Hampel, Westfield, N.J., assignor to RCA Corporation

Filed Aug. 6, 1970, Ser. No. 61,678
Int. Cl. H03k 19/08
U.S. Cl. 307—207 16 Claims



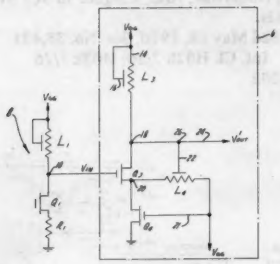
A pair of load impedances, and a plurality of signal controlled means, each such means supplying a current to one or the other of the load impedances depending upon the binary value represented by the signal controlling that means. By judicious choice of the respective values of the load impedances, the respective voltages developed across them is made to represent different logic functions, which may be completely unrelated to one another, of the input signals. The signal controlling a means may be an external signal or may be a feedback signal produced internally of the circuit.

3,678,293

SELF-BIASING INVERTER

Jay D. Popper, Queens, N.Y., assignor to General Instrument Corporation, Newark, N.J.

Filed Jan. 8, 1971, Ser. No. 104,988
Int. Cl. H03k 19/40
U.S. Cl. 307—214 17 Claims



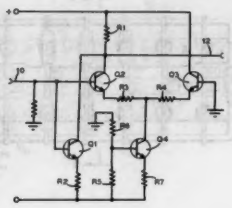
A self-biasing inverter circuit comprises a load device and a semiconductor driving field effect transistor connected in series with a low-impedance device across a voltage source. The input is impressed on the gate terminal of the driving FET and the output is taken off the junction between the driving FET and the load device. A second field effect transistor having a high output impedance is connected between the source of the driving FET and the negative side of the voltage source and has its gate terminal connected to the inverter output. In this manner the source of the driving FET is biased to a negative voltage level sufficient to maintain said driving FET in the nonconductive state even for logic "O" signal more negative than threshold. In addition the bias signal is automatically diminished as a logic "1" input is impressed on the gate of the driving FET to aid in rendering the driving FET conductive.

3,678,294

AMPLIFIER STAGE CIRCUIT FOR A LOGARITHMIC AMPLIFIER

Wolfgang Glathe, Munich, Germany, assignor to Schlumberger Overseas Messgeratebau und Vertrieb GmbH, Munich, Germany

Filed Nov. 10, 1970, Ser. No. 88,447
Claims priority, application Germany, Nov. 11, 1969, P 19 56 692.8
Int. Cl. H03k 17/00
U.S. Cl. 307—230 1 Claim



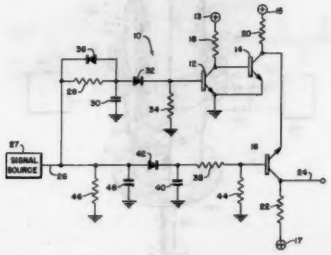
An amplifier stage for a logarithmic amplifier having a plurality of such stages connected in cascade. Each stage comprises a linear amplifier and a differential amplifier having a common load resistance, a common input terminal and a common output terminal at one end of the load resistance; these two terminals are also the input and output terminals of the stage. The linear amplifier delivers an output which is a linear function of its input over the entire range of permissible input values. The differential amplifier delivers an output which is a linear function of its input for input values below a predetermined limit, and delivers a constant output for input values above this limit. The output of the stage is the sum of the output from the linear amplifier and the output from the differential amplifier. Below the predetermined limit the output of the stage is thus the sum of two linear outputs; above this limit it is the sum of a linear output and a constant output. The gain of the stage is therefore constant below the limit, but falls off above the limit.

3,678,295

TRANSISTION SENSING CIRCUIT

Patrick J. Heneghan, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 29, 1969, Ser. No. 888,731
Int. Cl. H03k 5/13, 17/28
U.S. Cl. 307—235 20 Claims



A transition sensing circuit, which normally provides a first output, provides a second output for a predetermined duration whenever the input to the circuit changes from an input of a first type to an input of a second type, or vice versa. When the input to the circuit changes from an input of the first type to an input of the second type, the second output is obtained from the circuit for the time required to charge a first capacitor to a voltage sufficient to overcome the forward breakdown

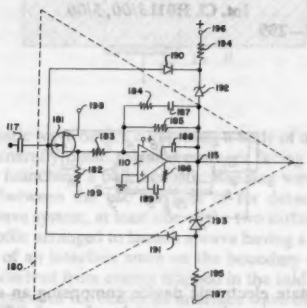
voltage of a diode. When the input to the circuit changes from an input of the second type to an input of the first type, the second output is obtained from the output of the circuit for the time required to discharge a second capacitor to a predetermined voltage.

3,678,296

ELECTRICAL SIGNAL SLOPE POLARITY CHANGE DETECTOR

Christopher C. Day, Newtonville, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed April 14, 1970, Ser. No. 28,442
Int. Cl. H03k 5/20
U.S. Cl. 307—231 **4 Claims**



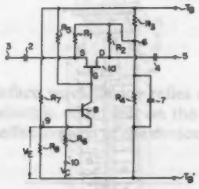
An electrical signal slope polarity change detector. A circuit for detecting changes in slope polarity of an electrical input signal and for providing an output indication of each slope polarity change. The circuit utilizes an amplifier with negative feedback which changes substantially its value of feedback impedance during a change in slope polarity of the input signal. The input signal is capacitively coupled to the amplifier input. The circuit is, within limits, insensitive to input signal variations in amplitude, frequency, and offset level.

3,678,297

SWITCHING CIRCUIT

Susumu Takahashi, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1971, Ser. No. 116,155
Claims priority, application Japan, Feb. 20, 1970, 45/14451
Int. Cl. H03k 17/60
U.S. Cl. 307—251 **4 Claims**



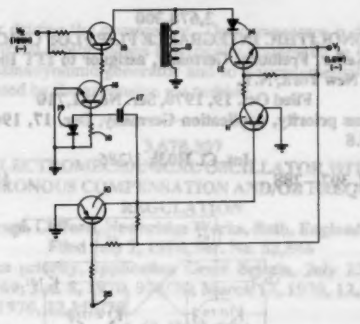
A switching circuit using a single field effect transistor for switching AC signals includes a junction type field effect transistor coupled in series with an AC signal circuit for selectively passing the AC signals from the source to the drain of said transistor. Circuit means supplies a constant gate voltage to the field effect transistor during the conductive period thereof, a voltage which is predetermined in accordance with the maximum magnitudes of the AC signals for forcing diode current to flow through at least one of the diode junctions of the field effect transistor such that the gate voltage follows the AC voltage applied to the source. A control circuit selectively renders the field effect transistor conductive or non-conductive as a function of the value of control signals, thereby switching the AC signals.

3,678,298

TWO-STEP MAGNETIC DRIVER

George A. Dyer, San Juan Capistrano, Calif., assignor to North American Rockwell Corporation

Filed April 28, 1971, Ser. No. 138,043
Int. Cl. H03k 5/12
U.S. Cl. 307—270 **4 Claims**



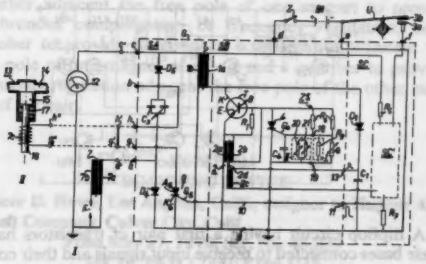
A drive circuit for pulse modulated excitation of an inductive load impedance and having both a fast turn-on/turn-off capability and minimum power consumption. A first transistorized power amplifier having a rapid turn-off response provides a sustaining excitation subsequent to the drive circuit delay transients, while a compensatory trigger circuit provides a compensatory output trigger wave form for compensating for the drive circuit turn-on delay transients.

3,678,299

TRANSISTOR CIRCUIT ARRANGEMENT FOR SUPPLYING A LOAD WITH WORK PULSES OF CONSTANT CURRENT INTENSITY

Rudolf Diener, Zurich, Switzerland, assignor to Autoelektronik AG, Chur, Graubunden, Switzerland

Filed Nov. 17, 1970, Ser. No. 90,299
Claims priority, application Switzerland, Oct. 13, 1970, 15140/70; Nov. 20, 1969, 17307/69
Int. Cl. H03k 17/00, 3/30
U.S. Cl. 307—275 **22 Claims**



A transistor circuit arrangement for supplying a load with work pulses of constant current intensity, comprising a load, a switching transistor having a collector-emitter path and a main winding of a feedback element connected in series with a direct-current voltage source. A control pulse generator for each work pulse gates the switching transistor via a control

winding of the feedback element coupled with the base of the switching transistor, and means serve to block the switching transistor each time when a current flowing through said series circuit has risen to a certain current intensity. More specifically, there is provided a control thyristor coupled with the base current circuit of the switching transistor and an ignition circuit for the control thyristor which contains a passive semiconductor component as a temperature-dependent resistor. The control thyristor is turned-on each time by the collector current of the transistor, the intensity of which is determined by the resistance value of the ignition circuit, and the switching transistor is completely blocked by the feedback element.

3,678,300

MONOLITHIC INTEGRABLE FLIP FLOP CIRCUIT

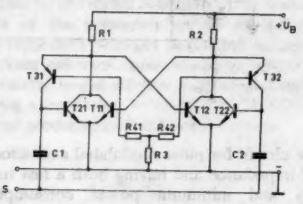
Hans Keller, Freiburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 19, 1970, Ser. No. 81,710

Claims priority, application Germany, Dec. 17, 1969, P 19 63 225.8

Int. Cl. H03k 3/286

U.S. Cl. 307—288 **12 Claims**



A monolithic integrable flip-flop circuit provides for information storage and reliable switchover by inserting a transistor between the base and collector of the control transistor of the flip-flop.

3,678,301

LOGIC MODULE CONNECTED TO ACT AS FLIPFLOP

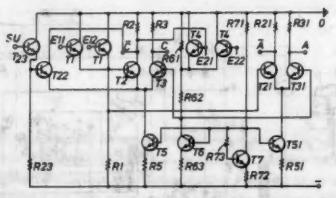
Gerd Fischer; Dieter Straub, and Heinz Eberhard Voigt, all of Constance, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Feb. 19, 1971, Ser. No. 117,034

Claims priority, application Germany, Feb. 20, 1970, P 20 07 912.3

Int. Cl. H03k 3/26, 3/286

U.S. Cl. 307—289 **3 Claims**



A flipflop circuit having a first pair of transistors having their bases connected to receive input signals and their collectors arranged to produce output signals, the transistors assuming respectively opposite switching states depending on the relative levels of the inputs thereto, a conductor connecting the collector of one transistor to one of the inputs of the other transistor for causing the transistors to remain in their existing switching states after the removal of input signals, and a second pair of transistors each having its base connected to the base of a respective transistor of the first pair and providing at their collectors the direct and complement output signals for the circuit. Means are provided to selectively place a conductive path across the emitter-collector of one transistor of the first pair, thereby to suppress the storage capability of the circuit.

3,678,302

SOLID STATE ELECTRONIC DEVICE UTILIZING DIFFERENCE IN EFFECTIVE MASS

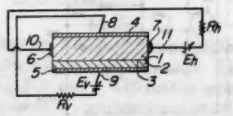
Hiroyuki Kasano, Akishima, and Masao Kawamura, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed March 10, 1971, Ser. No. 122,916

Claims priority, application Japan, March 13, 1970, 45/20883

Int. Cl. H01l 3/00, 5/00

U.S. Cl. 307—299 **15 Claims**



A solid state electronic device comprising an element including two semiconductor crystal regions of different effective mass of carriers forming a junction therebetween, and electrodes for forming two orthogonal electric fields in said element, in which carriers may be totally reflected at the junction by controlling one of the two fields to cause an abrupt change in the current flowing through the element.

3,678,303

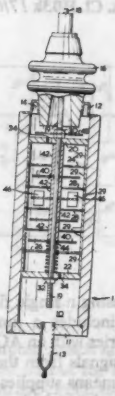
NUCLEAR POWER SOURCE

Kenneth J. Round, Ottawa, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed Jan. 28, 1970, Ser. No. 6,373

Int. Cl. G21d 7/00

U.S. Cl. 310—3 R **5 Claims**



There is provided means for utilizing radioactive emission from a radioisotope to generate relatively high voltages at small current densities.

3,678,304

ACOUSTIC WAVE DEVICE FOR CONVERTING BULK MODE WAVES TO SURFACE WAVES AND VICE VERSA

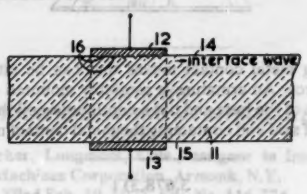
Reginald Frederick Humphryes, 5 Mygrove Close, Rainham, and Iain McLaren Mason, Chequers, Kiddington, near Woodstock, both of England

Filed Jan. 12, 1971, Ser. No. 105,935

Claims priority, application Great Britain, Jan. 15, 1970, 2,127/70

Int. Cl. H01v 7/00

U.S. Cl. 310—8 9 Claims



An acoustic wave device comprising a body of material having two generally plane, parallel surfaces facing each other, means for launching a bulk acoustic standing wave system in the body between the two surfaces or for detecting such a standing wave system, at least one of the two surfaces having a shaped profile arranged to launch a wave having a component consisting of an interface wave on the boundary of the body and being derived from energy trapped in the said bulk standing wave system or to receive an interface wave developed on the boundary of the body and to convert at least part of it into a bulk standing wave.

3,678,305

ACOUSTIC SURFACE WAVE DEVICES

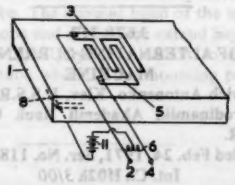
Edward George Sydney Paige, Malvern, England, assignor to Minister of Aviation Supply in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 5, 1971, Ser. No. 113,010

Claims priority, application Great Britain, Feb. 6, 1970, 5,732/70

Int. Cl. H01v 7/00

U.S. Cl. 310—8.1 11 Claims



An acoustic surface wave device relies on its effectiveness not on the piezoelectric effect but on the electrostrictive effect whereby the effectiveness of the device is electric field dependent.

3,678,306

JET PROPULSION POWER PLANT

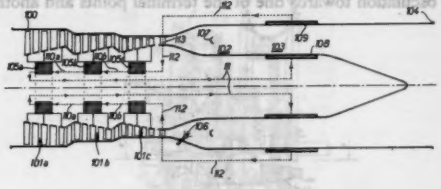
Michel Robert Garnier, Sceaux, and Christian Paul Gilbert Rioux, Antony, both of France, assignors to Societe Nationale D'Etude Et de Construction de Moteurs D'Aviation, Paris, France

Filed Jan. 14, 1971, Ser. No. 106,378

Claims priority, application France, Jan. 15, 1970, 7001440

Int. Cl. H02n 4/02

U.S. Cl. 310—11 14 Claims



A jet propulsion power plant comprising in succession a compressor, a supplemental heating means, an expansion gas turbine, a main heating means, and a magnetoplasmadynamic generator adapted to supply at least a part of the energy necessary for driving the compressor. The compressor is driven by an electrical motor means electrically connected to the magnetoplasmadynamic generator and to a supplemental generator rotated by the expansion gas turbine.

3,678,307

ELECTROMECHANICAL OSCILLATOR WITH ISOCHRONOUS COMPENSATION AND/OR FREQUENCY REGULATION

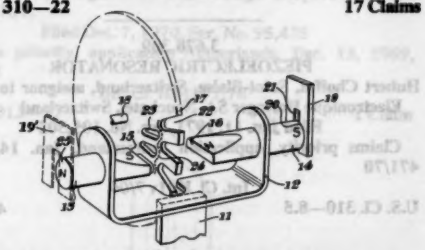
Cecil Frank Clifford, Newbridge Works, Bath, England

Filed July 7, 1970, Ser. No. 52,846

Claims priority, application Great Britain, July 23, 1969, 37,076/69; Jan. 8, 1970, 978/70; March 17, 1970, 12,723/70; May 7, 1970, 22,113/70

Int. Cl. H02k 7/06

U.S. Cl. 310—22 17 Claims



An electromechanical oscillator having an oscillating member which is electrically maintained in mechanical oscillation, in which a pair of magnets with opposite poles defining a gap is carried by a single oscillating member or by one or both tines of a tuning fork, and the rotor is so mounted that the wavy magnetic tracks pass through the gap or gaps between the pair(s) of magnets. There may be a magnetic member adjacent the free pole of one magnet to provide isochronous compensation or frequency regulation, or a member to provide isochronous compensation adjacent the free pole of one magnet of a pair and a member to provide frequency regulation adjacent the free pole of the other magnet of the pair.

3,678,308

SCANNING DEVICE

Spencer D. Howe, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

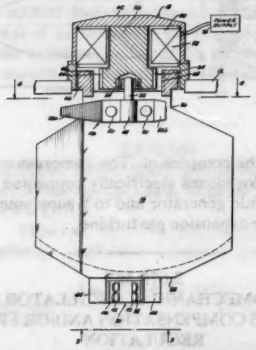
Filed May 27, 1970, Ser. No. 40,837

Int. Cl. B61f 17/00; F16c 1/24

U.S. Cl. 310—36 10 Claims

A mirror is oscillated through an angular arc defined by arc terminal points. Springs absorb the kinetic energy of halt at the terminal points, the springs returning the energy to the mirror thereby reversing the direction of oscillation thereof. Magnetic means coupled to the mirror provides a source of force to induce oscillation of the mirror and to bias the mirror to a position off the center point of the arc of oscillation when

operative. The magnetic means is so driven by a square wave signal, having twice the frequency of oscillation, to create an intermittent force on the mirror that one portion of the square wave force aids movement of the mirror from its center point of oscillation towards one of the terminal points and another



portion of the square wave force acts against movement (and spring energy) of the mirror from the terminal point towards the center point. Too slow or too fast movement of the mirror is compensated for by the square wave force. The mirror therefore moves at a substantially constant angular velocity between the terminal points.

3,678,309

PIEZOELECTRIC RESONATOR

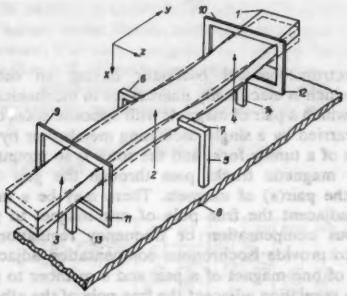
Hubert Choffat, Saint-Blaise, Switzerland, assignor to Centre Electronique Horloger SA, Neuchatel, Switzerland

Filed Jan. 11, 1971, Ser. No. 105,302

Claims priority, application Switzerland, Jan. 14, 1970, 471/70

Int. Cl. H01v *7/00*

U.S. Cl. 310—8.5 **4 Claims**



A piezoelectric resonator comprises a crystal blade working by flexion and having at least two nodal points, suspension means supporting the blade at one nodal point, and means for limiting movement of the blade located adjacent to at least one further nodal point.

3,678,310

INSTRUCTIONAL ELECTRIC MOTOR

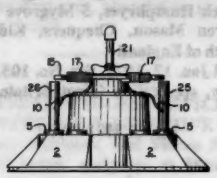
David E. Munn, Framingham, and Robert Maddestra, Hyde Park, both of Mass., assignors to Damon Corporation, Needham, Mass.

Filed June 30, 1971, Ser. No. 158,295

Int. Cl. H02k

U.S. Cl. 310—40 MM **4 Claims**

An electric motor that can be assembled by hand. The motor comprises a base having a plurality of holes in its periphery for housing bar magnets and a central elevated portion having metal contact means that can be attached to a power source. An armature is rotatably mounted on the central portion of the base and has a continuous coil thereon, with each end of said coil contacting the metal contact means.



3,678,311

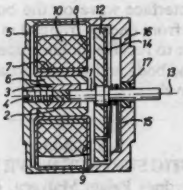
ELECTRIC MOTOR

Frederick William Mattingly, Middlesex, England, assignor to Toolmasters Limited, Hillingdon Heath, Middlesex, England

Filed Jan. 25, 1971, Ser. No. 109,436

Int. Cl. H02k *21/12*

U.S. Cl. 310—156 **9 Claims**



An electric motor comprising a rotor magnet of magnetically anisotropic material which has a plurality of regions each of which is magnetized in a preferred direction parallel to the axis of rotation of the rotor, alternate regions being magnetized in opposite directions so as to form north and south poles associated with a side of the rotor which faces pole pieces of a stator.

3,678,312

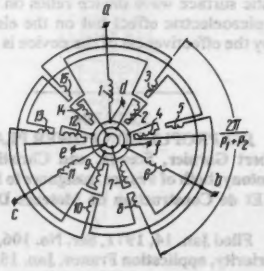
WINDING OF ALTERNATING CURRENT ELECTRIC MACHINE

Anatoly Ivanovich Antonenko, Kiev, U.S.S.R., assignor to Institut Elektrodinamiki Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

Filed Feb. 24, 1971, Ser. No. 118,305

Int. Cl. H02k *3/00*

U.S. Cl. 310—185 **4 Claims**



The invention relates to a winding of an alternating current electric machine combining the functions of two windings

having a different number of poles which comprises coils forming branches and distributed on a magnetic core. Some ends of these coils are connected to the terminals corresponding to one number of poles P_1 and the other ends thereof are connected to the terminals corresponding to the other number of poles P_2. At least one of said branches is made of at least two coils, the angle between the axis of which is approximately multiple to $2\pi/(P_1+P_2)$ radians, while the number of turns of one coil of the branch is proportional to the sine of the angle between the axis of the other coil and the axis of the same branch in electrical degrees.

3,678,313

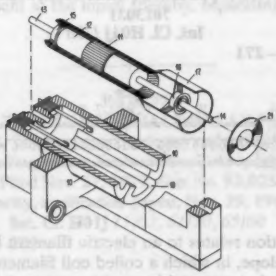
MOTOR ARMATURE HAVING AN INTEGRAL DRIVING SURFACE

John E. Parker, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 19, 1971, Ser. No. 116,774

Int. Cl. H02k *13/04*

U.S. Cl. 310—236 **7 Claims**



An integral capstan and tubular printed circuit armature for use in an electrodynamic machine, wherein individual printed circuit armature winding conductors are formed on both the inside and the outside surface of an epoxy-fiberglass tube. The inner and outer conductors are electrically interconnected at the ends of the tube. The annular band of the metallic interconnected tabs at one end of the tube extend beyond the area of interconnection and physically attach to and mount a second fiberglass tube which is the mounting portion of the capstan.

3,678,314

DISCOIDAL ELECTRIC MOTOR

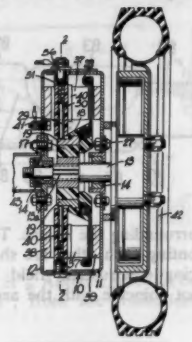
Alastair Howroyd Carter, Two Willows, The Crescent, Hampton-in-Arden, England

Continuation-in-part of Ser. No. 727,208, May, 1968, abandoned. This application June 17, 1970, Ser. No. 47,099

Int. Cl. H02k *1/22*

U.S. Cl. 310—268 **9 Claims**

An electric motor has a disc-shaped armature consisting of a plurality of overlapping coils lying in the general plane of the disc, each coil having a plurality of turns. Each coil has radial runs of wire lying side by side in the plane of the disc and interconnecting ends lying side by side in a tangential plane. The coils nest together in an annular array with one radial run of each coil lying directly over and closely adjacent a radial run of another coil spaced by several intervening coils in the array. The whole armature is encapsulated in a mass of a synthetic resin material with the outer ends of the coils lying in an outer ring of the mass, the inner ends of the coils lying in an inner ring of the mass and a thin disc portion of the mass enclosing the radial runs of the coils. There is a commutator connected



to the coils and co-acting with brushes and a fixed pole structure having pole faces closely adjacent the thin disc portion of the encapsulating mass.

3,678,315

LOW-PRESSURE SODIUM VAPOR DISCHARGE LAMP

Gustaaf Adolf Wesselink; Thomas Holmes; Arie Jan Rudolf De Kock, and Jan Goorissen, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 7, 1970, Ser. No. 95,435

Claims priority, application Netherlands, Dec. 13, 1969, 6918745

Int. Cl. H01j *61/18*

U.S. Cl. 313—27 **1 Claim**

A low-pressure sodium vapor discharge lamp subject to high current load employs a predetermined quantity of indium in addition to the sodium. This enables operation of the lamp under high current conditions without the need of an appendix.

3,678,316

PLURAL BEAM CATHODE RAY TUBE HAVING BOUNDARY-SHAPED CYLINDRICAL ELECTRODES CORRECTING BEAM ABERRATION

Piet Gerard Joseph Barten, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 5, 1970, Ser. No. 8,871

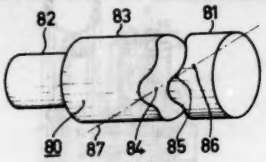
Claims priority, application Netherlands, Feb. 8, 1969, 6902025

Int. Cl. H01j *29/50, 31/20, 29/02*

U.S. Cl. 313—69 C **2 Claims**

A cathode ray tube comprising an electron gun for produc-

ing a plurality of beams located in a flat plane passing through the axis of the electron gun. The electron gun system comprises at least two cylindrical electrodes arranged in consecu-



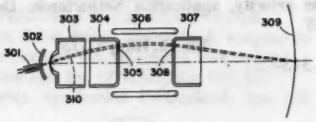
tive order and surrounding the beams. The ends of the two electrodes confronting each other are shaped to provide an aberration reducing electrostatic field for those electron beams that do not coincide with the axes of the two electrodes.

3,678,317

ELECTRON LENS FOR CONVERGENCE OF PLURALITY OF BEAMS

Yoshizumi Terazawa, and Kazuo Ayaki, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed July 23, 1970, Ser. No. 57,481
Claims priority, application Japan, July 25, 1969, 44/59150
Int. Cl. H01j *29/00, 29/50, 31/00*
U.S. Cl. 313—69 R **4 Claims**



An electron lens transmitting a plurality of electron beams from a source thereof to converge at different points on a screen whereby aberrations are caused to occur thereat, and each of two electrodes included in the lens are formed with spaced elongated openings of preselected configurations and predetermined dimensions in electrode sections adjacent to spaced peripheries of the electron lens for transmitting the respective beams through the peripheral openings in the respective electrodes to converge at a common point on the screen to minimize aberrations thereat.

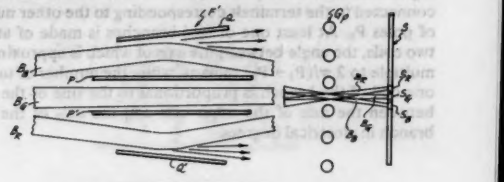
3,678,318

CATHODE RAY TUBE HAVING DIVERGENT DEFLECTION PLATES FOR CONVERGING THREE BEAMS

Susumu Yoshida; Akio Ohgoshi, both of Tokyo; Senri Miyaoka, Kanagawa-ken, and Yoshiharu Katagiri, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 697,414, Jan. 12, 1968, Pat. No. 3,448,316. This application June 2, 1969, Ser. No. 829,423. The portion of the term of this patent subsequent to June 3, 1986, has been disclaimed.
Int. Cl. H01j *29/50, 31/20, 29/70*
U.S. Cl. 313—70 C **3 Claims**

In a cathode ray tube in which a plurality of electron beams are focused on a screen by a focusing lens from which at least certain of the beams emerge along paths divergent with respect to the tube axis, and each of the beams emerging along a divergent path is deflected to cause convergence of the beams at a common area of the screen; such deflection of each diverging beam is effected by a pair of plates at different electrical potentials disposed at opposite sides of the respective divergent path to electrostatically deflect the beam therefrom, and the plate which is at the side of the respective divergent path away from which the beam is deflected is also divergent



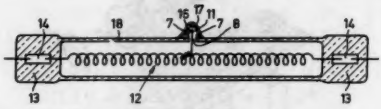
from the tube axis in the direction toward the screen so as to avoid impingement on such plate of electrons from the respective beam.

3,678,319

FILAMENT SUPPORT FOR TUBULAR LAMP

Victor Rosallie Noteltеirs, and Eduard Josef Philomena Janssen, both of Emmasingle, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 30, 1971, Ser. No. 175,866
Claim priority, application Netherlands, Sept. 3, 1970, 7013031
Int. Cl. H01j *1/88*
U.S. Cl. 313—271 **3 Claims**



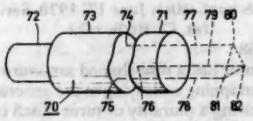
The invention relates to an electric filament lamp having a tubular envelope, in which a coiled coil filament is stretched. The filament is supported by a wire support a coiled part of which encloses a part of one turn of the filament, the inner diameter of said coiled part being maximum 1.5 times the outer diameter of the turn, and the length being minimum 1.5 times said outer diameter.

3,678,320

CATHODE RAY TUBE HAVING TRIANGULAR GUN ARRAY AND CURVILINEAR SPACING BETWEEN THE FOURTH AND FIFTH GRIDS

Piet Gerard Joseph Barten, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 769,612, Oct. 22, 1968, abandoned. This application Aug. 21, 1970, Ser. No. 66,072
Claims priority, application Netherlands, Nov. 11, 1967, 6715341
Int. Cl. H01j *29/50, 31/20, 29/02*
U.S. Cl. 313—70 C **1 Claim**



A single gun cathode ray tube for the display of colored television images including a separate cathode for each electron beam and common first, second, third, fourth and fifth grids, each having apertures for each beam. The ends of the fourth and fifth grids facing each other define a boundary having a sinusoidal shape.

3,678,321

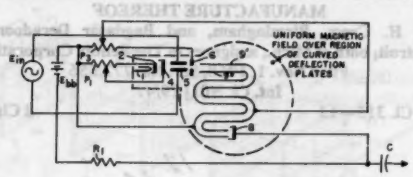
SIGNAL AND NOISE SEPARATION UTILIZING ZERO CROSSING ELECTRON TUBE AND CIRCUIT

Mortimer H. Zinn, West Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army

Division of Ser. No. 144,799, Oct. 12, 1961. This application Aug. 26, 1964, Ser. No. 398,139

Int. Cl. H01J 29/74

U.S. Cl. 313—78 1 Claim



The invention consist of an electron tube and circuitry which operate to determine whether a zero crossing of a wave consisting of signal mixed with noise is followed by a second zero crossing at a time not less than a predetermined interval. Accordingly, an output signal is produced whenever a true signal is present at the input; thereby, separating signals from noise.

3,678,322

MULTI-COLOR PLASMA DISPLAY PANEL

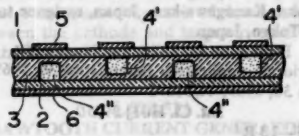
Hiroshi Souri, Tokyo, Japan, assignor to Iwatsu Electric Company, Ltd., Kugayama, Suginamiku, Tokyo, Japan

Filed Nov. 27, 1970, Ser. No. 93,025

Claims priority, application Japan, Nov. 29, 1969, 44/95381

Int. Cl. H01J 11/02, 61/30, 65/00

U.S. Cl. 313—201 3 Claims



In a plasma display panel comprising a center glass plate having plurality of openings each containing luminous gas, a pair of outer glass walls on the opposite sides of the center glass plate for sealing the gas and a plurality of electrodes on the outer surfaces of the outer glass walls for exciting the luminous gas, the openings are in the form of blind openings opened on the opposite surfaces of the center glass plates and are sealed with gasses of different discharge colors, thus providing a multi-color display pane..

3,678,323

HYDROGEN ION BEAM GENERATING ELECTRODE

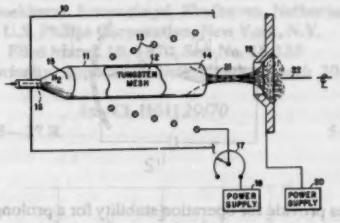
John E. Osher; John D. Kinney, both of Alamo, and James F. Steinhaus, Livermore, all of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 8, 1970, Ser. No. 96,145

Int. Cl. H01J 17/26

U.S. Cl. 313—231 7 Claims

A hollow metallic electrode having a metallic mesh in the central portion thereof and a variable temperature heater for generating a hydrogen ion beam. By controlling the temperature of the electrode, its output is selectable from molecular hydrogen at temperatures below 1,500° K. to essentially pure monoatomic hydrogen for temperatures near or above 2,800° K. The combination of the electrode output and the source arc then allows a range of selection in ion source output composition of H^+, H^+_2 and H^+_3. Above 2,800° K., the source output is essentially pure H^+, from arc ionization of monoatomic hydrogen.



3,678,324

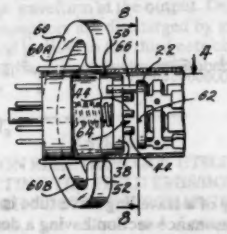
CATHODE RAY TUBE HAVING STANDBY CATHODE ASSEMBLY ON ROTATABLE SUPPORT

James L. Leonard, 102 Archer Drive, Godfrey, Ill.

Filed June 17, 1970, Ser. No. 47,002

Int. Cl. H01J 1/00, 21/22, 29/50

U.S. Cl. 313—236 14 Claims



Apparatus for use in cathode ray tubes and particularly in multi-gun color television picture tubes and like devices to enable substituting for the active cathodes and associated parts other standby cathodes and parts which will restore the tube to full emissive power and substantially double the life of the tube, said apparatus including a multicathode assembly mounted inside the neck portion of the envelope of the picture tube, said assembly having a plurality of active and standby cathodes and associated heater elements mounted thereon, and means including magnetic means for moving said assembly between alternate positions inside the tube envelope whereby selected ones of the cathodes and their associated heater elements are in operative positions and others are not. The present apparatus enables replacement of the active cathodes without requiring any modification of the tube envelope itself, without requiring removal of the tube from the set in which it is installed, and with little or no modification or adjustment of the set to accommodate the change.

3,678,325

HIGH-FIELD EMISSION CATHODES AND METHODS FOR PREPARING THE CATHODES

Jun Nishida, and Takahumi Ohhara, both of Osaka, Japan, assignors to Matsushita Electric Industrial Company, Limited, Kadoma City, Osaka, Japan

Filed March 10, 1970, Ser. No. 18,176

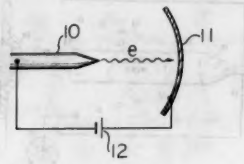
Claims priority, application Japan, March 14, 1969, 44/21072

Int. Cl. H01J 1/14, 19/06; H01k 1/04

U.S. Cl. 313—346 5 Claims

High-field emission cathodes fabricated by implanting metal ions of low work function into a pointed tip portion of a

formed cathode which is stable at high temperatures and chemically inert to gas molecules including oxygen. The

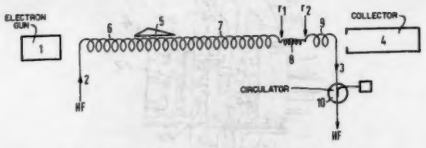


cathodes provide for operation stability for a prolonged period of time with a low applied voltage.

3,678,326
TRAVELLING WAVE TUBE HAVING IMPROVED EFFICIENCY

Hinrich Heynisch, Graefelfing, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 2, 1970, Ser. No. 94,323
Claims priority, application Germany, Dec. 23, 1969, P 19 64 721.3
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.6 **8 Claims**

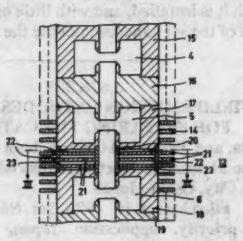


The efficiency of a travelling wave tube is improved by the provision of a resonance section having a decreased delay interval with regard to the normal delay interval of the delay line of the tube. The resonance section is interposed in the delay line at the collector-side end of the delay line in such a manner that reflecting impact points are present at its ends and that at a medium operational frequency of λ_o the length of the resonance section is $l = n\lambda_o/2$.

3,678,327
HEAT TRAP FOR AN AIR-COOLED VHF POWER KLYSTRON

Wolfgang Schmidt, Hamburg-Othmarschen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 30, 1970, Ser. No. 93,596
Claims priority, application Germany, Dec. 2, 1969, P 19 60 421.8
Int. Cl. H01j *25/10*
U.S. Cl. 315—5.39 **4 Claims**



A heat trap for an air-cooled klystron having components stacked to form the drift tube and individual resonators. The heat trap is arranged between the components and comprises a thin wall pipe forming part of the drift tube and having cooling fins attached to the exterior surfaces thereof. The cooling fins apertures for members supporting the stacked components.

3,678,328
CHANNEL MULTIPLIER ASSEMBLY AND METHOD OF MANUFACTURE THEREOF

Fred H. Cross, Birmingham, and Bagdasar Deradoorian, Detroit, both of Mich., assignors to The Bendix Corporation

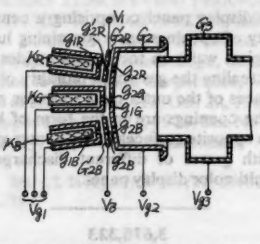
Filed Nov. 1, 1968, Ser. No. 772,556
Int. Cl. N01j *29/41*
U.S. Cl. 315—12 **2 Claims**

A bundle of individual channel multipliers stacked to form a multiplier array, the individual channels being fabricated of a lower temperature softening glass and the bundle being inserted into a higher temperature softening glass tube, the walls of the individual channels being expanded to fill the interstices within the higher softening temperature tube.

3,678,329
CATHODE RAY TUBE

Senri Miyaoka, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 22, 1970, Ser. No. 48,081
Claims priority, application Japan, June 30, 1969, 44/51893, Japan, June 30, 1969, 44/51892
Int. Cl. H01j *29/50*
U.S. Cl. 315—13 R **14 Claims**



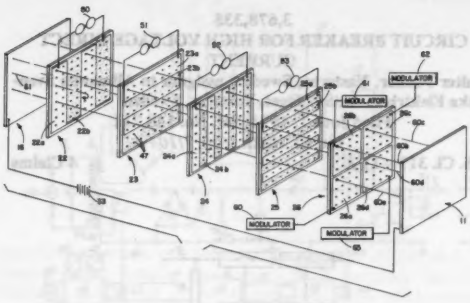
In a cathode ray tube of the type in which a plurality of electron beams are directed toward a phosphor screen by a beam generating assembly and are made to intersect each other substantially at the optical center of a main focusing electron lens by which all of the beams are focused on the screen, the usual grid electrode assembly is provided with an additional or auxiliary electrode for at least one of the beams, which auxiliary electrode has applied thereto a selected voltage by which the beam cutoff voltages for the plural beams can be maintained at selected values while permitting independent control of the modulation conditions for the several beams.

3,678,330

MULTI-BEAM ELECTRON BEAM SCANNER UTILIZING A MODULATION PLATE FOR MODULATING EACH OF THE BEAMS INDEPENDENTLY

Bobby L. Landrum, Palos Verdes Peninsula, Calif., assignor to Northrop Corporation, Beverly Hill, Calif.

Filed May 1, 1970, Ser. No. 33,838
Int. Cl. H01j 29/50
U.S. Cl. 315—13 R 4 Claims



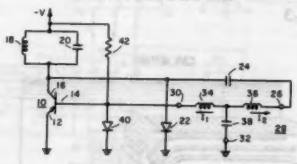
A plurality of flat coded dynode members are sandwiched between an electron emitting cathode in the form of flat plate and a flat target plate. Each dynode member has a plurality of apertures formed therein which are aligned with corresponding apertures on all of the other dynodes, each such set of aligned apertures forming an electron beam channel. The dynodes also each have a pair of separate conductive finger patterns, the finest of such finger patterns defining an elemental scanning area of the target plate. The finger patterns and number of dynodes utilized are chosen so as to provide a predetermined number of simultaneous scanning beams. A modulation grid having apertures therein corresponding to the apertures on the dynode and having separate portions covering the areas encompassed by each of the scanning beams is placed between the cathode and target to control the energization of the beams.

3,678,331

SAWTOOTH CURRENT GENERATOR

Martin Fischman, Wantagh, N.Y., assignor to GTE Laboratories Incorporated

Filed Jan. 22, 1970, Ser. No. 5,062
Int. Cl. H01j 29/70
U.S. Cl. 315—27 TD 7 Claims



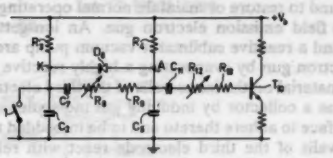
A sawtooth current generator is disclosed which provides a linear time varying current for the coil of a magnetic deflection system of a television display tube. The coil is coupled to the collector of a transistor and the transistor is coupled to a resonant circuit which provides feedback to sustain the circuit oscillations and to actuate the transistor. In addition, a diode is coupled to the collector of the transistor. A constant voltage is maintained across the inductor by the alternate conduction of the transistor and the diode so that a linear time varying current flows in the inductor.

3,678,332

CIRCUIT ARRANGEMENT FOR ADJUSTING THE LINEARITY OF THE DEFLECTION SIGNAL GENERATED FOR A DEFLECTION SYSTEM

Antonius Boekhorst, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed March 10, 1970, Ser. No. 18,135
Claims priority, application Netherlands, March 20, 1969, 6904267
Int. Cl. H01j 29/70
U.S. Cl. 315—27 R 5 Claims



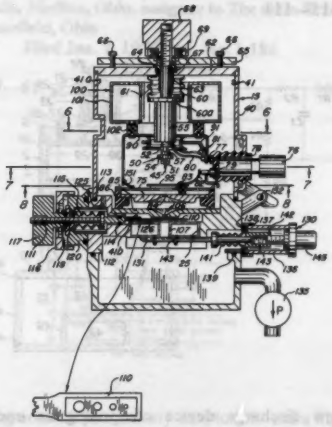
A circuit arrangement for adjusting the linearity of the deflection signal generated for a deflection system, particularly for a field deflection signal in a television receiver. Two RC-networks which are connected through a third RC-network during the sweep are arranged after the field oscillator between supply voltage and earth. The variation of the resistor in this third RC-network renders it possible to vary the curvature of the voltage waveform at the output. During the flyback the two charge capacitors are discharged by means of a diode which is connected parallel to the third network. The frequency amplitude and linearity adjusting members are separated from one another.

3,678,333

FIELD EMISSION ELECTRON GUN UTILIZING MEANS FOR PROTECTING THE FIELD EMISSION TIP FROM HIGH VOLTAGE DISCHARGES

Vincent J. Coates, Los Altos, and Leonard M. Welter, Saratoga, both of Calif., assignors to American Optical Corporation, Framingham, Mass.

Filed June 15, 1970, Ser. No. 46,425
Int. Cl. H01j 29/56
U.S. Cl. 315—31 37 Claims



A field emission electron gun comprises a field emission tip as its source of electrons. A first anode is spaced downstream from the tip and when a voltage is applied between the first anode and the tip, electrons from the tip are accelerated toward the first anode. An opening in the first anode limits the

angular spread of the electron beam. A second anode is spaced downstream from the first anode and when a voltage is applied between the second anode and the tip, the energy level of the electrons at the image or specimen plane is controlled. The electrostatic field between the first and the second anode brings the electron beam into focus.

For protecting the field emission tip against high voltage discharges, a third electrode in the form of a shield electrode surrounds the field emission tip and is maintained at or near the electrical potential of the tip. Within the shield is a fourth electrode or intermediate electrode which serves, when voltage is applied thereto as an electrode, to draw electrons from the tip and to restore or maintain normal operating conditions for the field emission electron gun. An ion-getter vacuum pump and a reactive sublimator vacuum pump are formed in the electron gun by evaporating a highly reactive element or getter material on the inner walls of the third electrode, which serves as a collector by inducing gas molecules which strike this surface to adhere thereto and to be imbedded therein. The inner walls of the third electrode react with reactive gases present in the region of the tip and the fourth electrode. The ion getter pump operates by ionizing residual gas molecules which are then impelled by electric fields and are imbedded under the coating of sublimed getter material. The primary electron beam from the tip strikes the surface of the fourth electrode, thereby causing reflected and secondary electrons to be emitted from the surface, which electrons form an electron cloud capable of ionizing molecules within the chamber. The electron cloud is formed and the ionized gas molecules are collected by applying the appropriate potentials to the electrodes in the gun assembly. The third electrode may be cooled by a liquid nitrogen cooling system, which functions as a cryogenic vacuum pump. This cooling system can also be used to cool the tip in order to reduce the tip flicker noise resulting in greater stability of electron emission.

3,678,334

NON-THERMIONIC GLOW DISCHARGE DEVICES

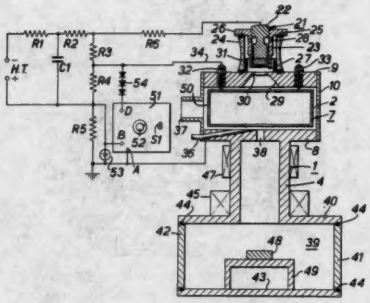
Ronald Arthur Dugdale, Blewbury; Stanley Denis Ford, Newbury, and John Thomas Maskrey, Abingdon, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Sept. 2, 1969, Ser. No. 854,404

Claims priority, application Great Britain, Sept. 5, 1968, 42,371/68

Int. Cl. H01j 37/06

U.S. Cl. 315—111 **2 Claims**



A glow discharge device comprising an enclosure and means to maintain a suitable gas in the enclosure at a predetermined pressure. An electrode arrangement is either at least partly disposed within the enclosure or forms part of a wall of the enclosure. The electrode arrangement includes one or more anodes, a cathode, and a control electrode. Power supply means are provided to apply a electrical potentials to the anode or anodes said cathode and said control electrode to maintain a first potential difference between an anode and said cathode to generate a first glow discharge, and to maintain a second potential difference between an anode and said control electrode to generate a second glow discharge. The combined first and second glow discharges produces a beam of charged particles, the power intensity of which is controlled by varying the potential applied to the control electrode to vary the glow discharge independently of the potential applied to the cathode.

3,678,335

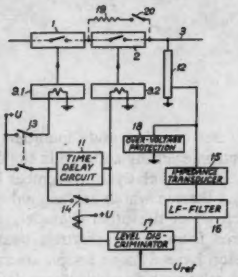
CIRCUIT BREAKER FOR HIGH VOLTAGE DIRECT CURRENT

Walter Pucher, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed June 1, 1971, Ser. No. 148,711

Int. Cl. H02h 3/00, 7/10

U.S. Cl. 317—11 A **4 Claims**



In a switching device for HVDC comprising two series-connected breaker units, the operating release of the device comprises a time delay means controlled by the voltage of the HVDC network. When breaking at voltages above a certain level, one of the breaker units opens a predetermined time before the other one, thus reducing the switching over-voltage. Below said level, however, the breaker units open simultaneously.

3,678,336

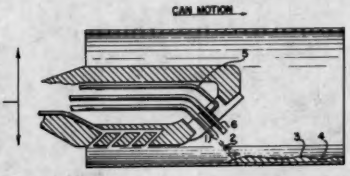
ELECTROSTATIC POWDER STRIPING APPLICATOR

Robert A. Winkless, Oak Lawn, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed July 10, 1970, Ser. No. 53,755

Int. Cl. B05b 5/02

U.S. Cl. 317—3 **6 Claims**



A powder applicator nozzle is set at an acute angle to the direction of travel of the workpiece. The applicator has corona charging pins to impart an electric charge to the powder coming from the nozzle. Powder is jetted from the powder nozzle past the corona charging pins. Air under pressure is used for cleaning the charging pins to avoid powder particles clinging to the pointed tip and destroying its electrical characteristics.

3,678,337

ENVIRONMENTAL CONTROL APPARATUS

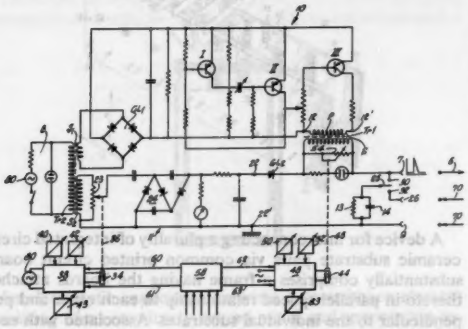
Kurt Grauvogel, Ottweiler, Saar, Germany

Continuation-in-part of Ser. No. 765,605, Oct. 7, 1968. This application July 9, 1969, Ser. No. 840,444

Claims priority, application Switzerland, July 11, 1968, 10432/68

Int. Cl. H05b 3/00

U.S. Cl. 317—4 14 Claims



The apparatus re-creates indoors electric and magnetic fields which occur naturally out-of-doors. A direct current field is created in an enclosure, such as a building, and low-frequency recurring disturbances or pulses are created in the field. The disturbances and/or the direct current field can be varied in time duration and frequency, either in a random manner or a pre-determined pattern, in order to avoid unresponsiveness of the persons in the building to the beneficial effects of the fields.

3,678,338

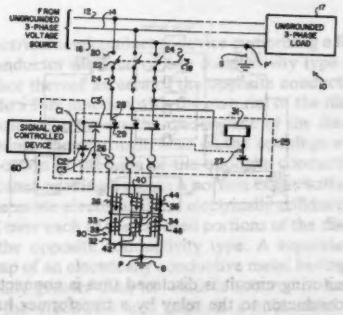
PROTECTIVE AUTOMATICALLY DISCONNECTABLE GROUPING MEANS FOR AN UNGROUNDED A.C. ELECTRICAL DISTRIBUTION SYSTEM

Robert W. Beachley, P.O. Box 11281, Charlotte, N.C.

Filed Feb. 25, 1971, Ser. No. 118,700

Int. Cl. H02h 3/16

U.S. Cl. 317—18 R 10 Claims



An ungrounded a.c. electrical distribution system is provided with a protective grounding device in circuit with means for automatically disconnecting the grounding device in the event that a fault to ground occurs on any line of the system. The grounding device can be a transformer having a neutral grounded point. The automatic disconnection means may be circuit breakers or current limiting fuses and may further include a relay assembly having automatically opening contacts. The relay assembly can be thermally operable. The transformer can be a zig-zag transformer. External signal devices can be connected to the relay assembly.

3,678,339

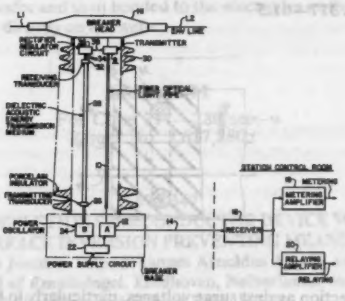
SIGNAL TRANSMITTING SYSTEM FOR EXTRA HIGH VOLTAGE TRANSMISSION LINE

Shan C. Sun, Penn Hills; Paul O. Raygor, Irwin, both of Pa., and , assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 25, 1971, Ser. No. 127,874

Int. Cl. H02h 1/00

U.S. Cl. 317—58 11 Claims



An apparatus for providing power for transmitting relaying signals from an extra high voltage transmission line to ground potential which avoids the use of a high cost current transformer and which is immediately effective to provide such signals when the transmission line is initially energized to protect such line if it is energized when a fault is present. The apparatus supplies the power from ground potential to line potential by means of sonic quantity transmitted from a first transducer to a second transducer through an elongated rod-like insulating member which preferably is caused to vibrate at its resonant frequency.

3,678,340

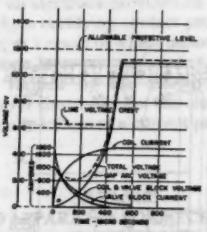
LIGHTNING ARRESTER AND GAP UNIT THEREFOR

John W. Kalb, Medina, Ohio, assignor to The Ohio Brass Company, Mansfield, Ohio

Filed Jan. 7, 1970, Ser. No. 1,186

Int. Cl. H02h 9/06

U.S. Cl. 317—61 16 Claims



A lightning arrester particularly adapted for extra high voltage AC systems and high voltage DC systems comprising a series of arc gap units and coil assemblies for moving the arcs outwardly. The gap units and coil assemblies are connected in series between a line of the system to be protected and ground without the intervention of series valve blocks. The gap units develop arc voltages greater than the system line to ground voltage so that the gaps can interrupt the power follow cur-

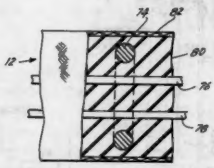
rent, but the total of the gap voltage and coil assembly voltage does not exceed the allowable protective level at any time. The gap units are designed so that the arcs flutter so as to minimize localized overheating and erosion of the gap plate material.

3,678,341

SURGE VOLTAGE PROTECTION SYSTEM

James M. Constable, Flushing, N.Y., assignor to Del Electronics Corp., Mount Vernon, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,379
Int. Cl. H02h 1/04
U.S. Cl. 317—61.5 **3 Claims**



Protection against surge voltages, particularly in high power applications such as electron welding systems, is provided by causing a pair of electrical conductors carrying current in opposite directions to pass through a toroid of high magnetic permeability, that toroid producing a high inductance in those lines without saturating, that inductance acting in conjunction with protective capacitors connected across the lines so as to minimize the surge voltages produced by short circuits or other abnormalities in the overall system.

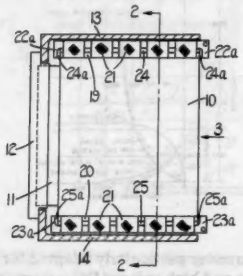
3,678,342

MOUNTING ARRANGEMENT FOR A BOARD WHICH SUPPORTS ELECTRICAL CONDUCTORS

Jeffery Isaac Shaw, Cook Hill, near Alcester, England, assignor to Joseph Lucas Industries Limited, Birmingham, England

Filed Jan. 6, 1971, Ser. No. 104,236
Int. Cl. H05k 7/20
U.S. Cl. 317—100 **14 Claims**

A mounting arrangement for a printed wiring board has flexible tongues, which include bars secured to opposite sides of the board by braided metal strips, engageable in guides in a



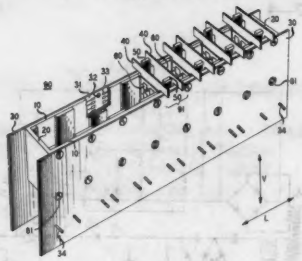
supporting structure by clamps which form part of the guides. The arrangement achieves good thermal conduction between the supporting structure and the boards without applying stresses to the latter.

3,678,343

CERAMIC SUBSTRATE INTERCONNECTION DEVICE

Robert Earl Van Duyne, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 30, 1971, Ser. No. 175,869
Int. Cl. H05k 7/14, 7/18
U.S. Cl. 317—100 **9 Claims**



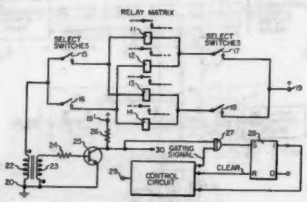
A device for interconnecting a plurality of integrated circuit ceramic substrate pairs via common printed circuit boards substantially comprises a frame having the boards attached thereto in parallel spaced relationship to each other and perpendicular to the individual substrates. Associated with each substrate pair to form a module are first and second camming members and first and second backing plates, each plate being directly adjacent to and in intimate contact with its associated substrate. Upon insertion of the camming members into associated channels on the frame, a force directed longitudinally along the device is applied to the backing plates thereby separating the plates and urging conductive terminals located along opposite edges of the substrates against associated resilient spring contacts mounted on the frame. It is a feature of this invention that the structural backing plate also serves to dissipate heat generated by its associated substrate.

3,678,344

ELECTROMAGNETIC RELAY OPERATION MONITOR

William R. Wedmore, Glen Ellyn, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 25, 1971, Ser. No. 118,717
Int. Cl. H01h 47/00
U.S. Cl. 317—137 **1 Claim**



A monitoring circuit is disclosed that is connected to the driving conductor to the relay by a transformer having one winding in series with the drive line from a fast operating, electronic, common control sequencing circuit. The monitor circuit includes a transistor, connected to another winding of the transformer and normally biased to be nonconductive. The transistor is brought into its conductive state by the dip in the operating current flowing in the drive conductor as sensed by the transistor to set a bistable device to record the operation of the relay.

3,678,345

CAPACITOR IMPREGNATED WITH ELECTROLYTE AND OIL CONTAINING DEPOLARIZER

Niels Hvidtfeldt, Snebaervaenget, and Adam Ruttkay, Drosselvej, both of Denmark, assignors to Wicon Kondenstorfabrik A/S, Copenhagen, Denmark

Filed Jan. 22, 1971, Ser. No. 108,925

Claims priority, application Great Britain, Jan. 23, 1970, 3,462/70

Int. Cl. H01g 9/00

U.S. Cl. 317—230 4 Claims

An electrolytic capacitor comprises a capacitance element consisting of a convolutely wound metal and spacer strip assembly, which is impregnated with an electrolyte and additionally impregnated with oil which also completely fills a metal can in which the capacitance element is enclosed.

3,678,346

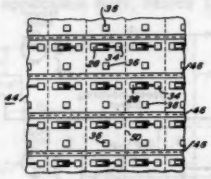
SEMICONDUCTOR DEVICE AND METHOD OF MAKING THE SAME

Jack M. Hirshon, Doylestown, and Philip D. Warner, Lansdale, both of Pa., assignors to TRW, Inc.

Filed Nov. 10, 1964, Ser. No. 410,182

Int. Cl. H01l 11/14

U.S. Cl. 317—234 R 3 Claims



An electrical semiconductor device comprising a flat disc of a semiconductor material of one conductivity type having in one surface thereof an area of the opposite conductivity type to provide a P-N junction with the material of the disc. A protective oxide film covers the one surface of the disc and has two openings therethrough. One of the openings exposes at least a portion of the area of the opposite conductivity type and the other opening exposes a portion of the surface of the disc. A separate electrode of an electrically conductive metal is coated over each of the exposed portions of the disc and the area of the opposite conductivity type. A separate flat terminal strap of an electrically conductive metal having a length substantially greater than its width is secured at one end to each of the electrodes and extends a substantial distance beyond the edge of the disc. The terminal straps lie in a plane juxtaposed and parallel to the surface of the disc and are secured to their respective electrodes along a flat surface of the straps. Also, the straps are arranged so that they are not in alignment with each other. For a three terminal semiconductor device, such as a transistor, a third electrode is provided in a third opening in the oxide film and a third terminal strap is attached to the third electrode and extends beyond the edge of the disc. The third terminal strap is arranged so that it is not in alignment with either of the other two terminal straps.

The semiconductor device is made as part of a large flat wafer of the semiconductor material which contains a plurality of the semiconductor devices and which is cut or broken apart between the semiconductor devices to separate them. A surface of the wafer is coated with a protective oxide film, and the P-N junctions of the semiconductor devices are formed in the surface of the wafer through holes provided in the oxide film. After the P-N junctions are formed, the electrodes for the semiconductor devices are coated on the surface of the wafer through holes provided in the oxide layer. The terminal straps for all of the semiconductor elements are then simultaneously formed and simultaneously bonded to their respective electrodes. The terminal straps may be formed separate from the wafer and then bonded to the electrodes or they may be formed directly on the wafer.

ERRATUM

For Class 317—280 see:
Patent No. 3,677,280

3,678,347

DEEP DEPLETION SEMICONDUCTOR DEVICE WITH SURFACE INVERSION PREVENTING MEANS

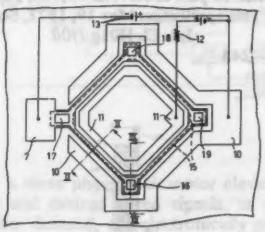
Theodorus Joannes Tulp; Johannes Arnoldus Appels, and Else Kooi, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 24, 1970, Ser. No. 49,403

Claims priority, application Netherlands, July 1, 1969, 6910027

Int. Cl. H01l 11/14

U.S. Cl. 317—235 R 11 Claims



A semiconductor device, for example, a deep-depletion field effection traNsistor, in which the formation of an inversion layer below an electrode provided on an insulating layer is counteracted by a rectifying contact preferably connected to said electrode, as a result of which minority charge carriers below the electrode layer are removed. As a result of this a depletion zone formed by the electrode potential in a semiconductor layer situated below the electrode can expand without hindrance to influence a current path in the semiconductor layer.

3,678,348

METHOD AND APPARATUS FOR ETCHING FINE LINE PATTERNS IN METAL ON SEMICONDUCTIVE DEVICES

Robert L. Reber, Sunnyvale, and James C. Huiskens, San Jose, both of Calif., assignors to Communications Transistor Corporation, San Carlos, Calif.

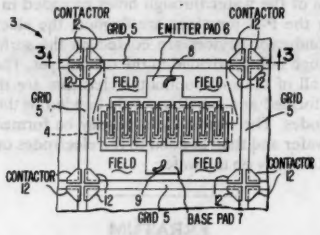
Continuation-in-part of Ser. No. 62,446, Aug. 10, 1970, abandoned. This application Nov. 23, 1970, Ser. No. 91,734

Int. Cl. H01l 19/00

U.S. Cl. 317—235 12 Claims

A method for etching fine line patterns in a metal film overlaying an apertured insulative layer on a semiconductive sub-

strate is disclosed. In the method, a layer of etch-resistance material is deposited over the metal film to be etched, such etch-resistance layer being apertured with a fine line aperture pattern portion and an open field aperture portion. The open field portion is disposed overlaying the non-apertured portion of the insulative layer. In addition, the layer of etch-resistant material includes a contactor portion bridging between the



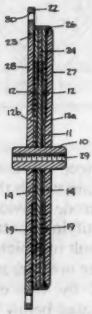
open field portion of the aperture pattern therein and a nearby aperture through the insulative layer to the semiconductive substrate to protect, from the etchant, a conductive bridge between the semiconductive substrate and the field portion of the metal film to be etched. The conductive bridge forms a conductive path independent of the active semiconductive junctions of the semiconductive device being formed. The metal film is then preferably etched in an electrolytic cell.

3,678,349

CAPACITOR

Paul Russo, Franklin Square, N.Y., assignor to Polyflon Corporation, New Rochelle, N.Y.

Continuation-in-part of Ser. No. 49,746, June 25, 1970, abandoned. This application May 19, 1971, Ser. No. 144,910
Int. Cl. H01g 1/08
U.S. Cl. 317—243 **14 Claims**



A capacitor is produced by stacking on a rod-like conductor two spaced capacitor discs separated by a metallic disc or radial element all in intimate contact, and encircling the discs with a metal retaining element in contact with the peripheries of the capacitor discs, the metal disc having a smaller diameter. The capacitor discs are formed from plastic materials such as polytetrafluoroethylene polymer or printed circuit board material or the like, clad on both sides with the cladding being removed on one side adjacent the outer periphery and on the other side adjacent a central aperture, the capacitor elements being secured in assembled relationship. A plurality of the aforesaid capacitors can be conveniently secured in stacked relationship to provide increased capacitance.

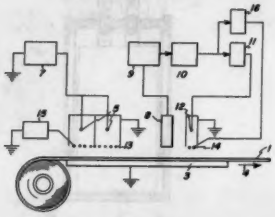
3,678,350

ELECTRIC CHARGING METHOD

Seiji Matsumoto; Masamichi Sato, and Osamu Fukushima, all of Asaki, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed April 19, 1971, Ser. No. 134,940
Int. Cl. H01t 19/00
U.S. Cl. 317—262 A **4 Claims**

Apparatus for uniformly charging the surface of an insulating member by first charging a portion of the surface to a magnitude smaller than the desired amount of charge by a first charging electrode. The amount of charge thus deposited is subsequently detected and compared with the desired amount



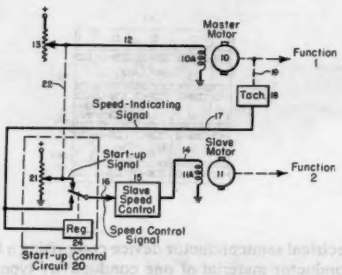
of charge to be deposited. As a result of the comparison, a second charging electrode, spaced apart from the first charging electrode, is energized whereby the total charge applied to the portion of the insulating member previously charged is substantially equal to the desired amount of charge.

3,678,351

MASTER-SLAVE MOTOR SYSTEM WITH START-UP CONTROL CIRCUIT

Richard Shemanske, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 24, 1971, Ser. No. 146,260
Int. Cl. H02p 1/56
U.S. Cl. 318—61 **9 Claims**



A control circuit provides start-up speed control for a slave motor from a pot ganged to another pot regulating the master motor speed. The speed of either the master motor or slave motor is sensed. When the sensed speed reaches a preset value, control of the slave motor is switched from the start-up pot to a speed-indicating signal derived from the master motor.

3,678,352

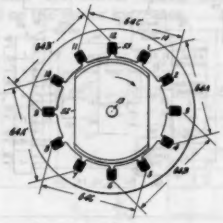
COMPATIBLE PERMANENT MAGNET OR RELUCTANCE BRUSHLESS MOTORS AND CONTROLLED SWITCH CIRCUITS

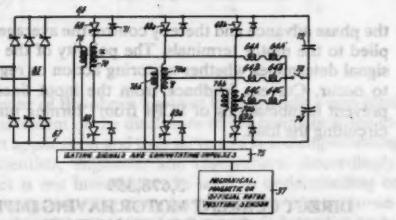
Burnice D. Bedford, Scotia, N.Y., assignor to General Electric Company

Filed Nov. 6, 1970, Ser. No. 87,484
Int. Cl. H02k 29/00
U.S. Cl. 318—138 **9 Claims**

Brushless motors have physical and electrical characteristics to be compatible with energization by the simple

square or stepped wave voltages easily produced with inverter type motor control circuits having a small number of controlled switches responsive to a rotor position sensor. These motors employ a few pairs of opposing non-distributed stator windings arranged overlapping or non-overlapping with a





predetermined winding pitch, and a constant gap magnetically polarized or non-polarized rotor with pole faces having related angular dimensions, to thereby produce rectilinear back emf voltages with approximately the same wave shape as the energizing voltages. The circuits can control the applied voltage to adjust motor speed.

3,678,353

ELECTRONIC DEVICE FOR ELECTRICALLY BRAKING INDUCTION MOTORS, PARTICULARLY THREE-PHASE MOTORS

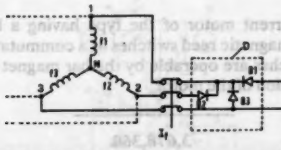
Giorgio Marchi, Via Zuretti 64, Milano, Italy

Filed March 17, 1971, Ser. No. 125,073

Claims priority, application Italy, March 23, 1970, 22287 A/70

Int. Cl. H02p *3/20*

U.S. Cl. 318—211 **7 Claims**



A dynamic brake circuit for an a-c motor which includes a single phase a-c circuit connected across two stator terminals of a three phase motor after the motor energizing circuit is opened. A first diode is connected in series with the single phase a-c circuit and the two stator terminals. Two additional diodes are connected from the stator terminal receiving the first diode to the other two stator terminals, respectively, by the device which connects the single phase a-c circuit to the stator terminals.

3,678,354

DC MOTOR CONTROL APPARATUS

Tatsushi Kitanosono, Yokohama-shi; Yukio Mashimo, and Yoshiyuki Takishima, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

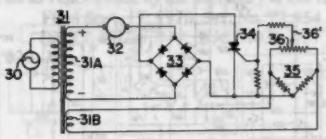
Filed Oct. 13, 1969, Ser. No. 865,587

Claims priority, application Japan, Oct. 16, 1968, 43/75378; Oct. 16, 1968, 43/75379; June 6, 1969, 44/44481; Aug. 20, 1969, 44/65817

Int. Cl. H02k *7/22*

U.S. Cl. 318—294 **7 Claims**

Apparatus for controlling the drive of a direct current (DC) motor to permit it to be rotated reversibly, which comprises a motor driving circuit with a DC motor and switching means connected in series with an alternating current (AC) source and a resistor bridge circuit for controlling the switching



means. The DC motor is driven to rotate reversibly under the control of the switching means to be energized by the output voltage of pickup terminals of said resistor bridge circuit to bring a controlled object into the predetermined position.

3,678,355

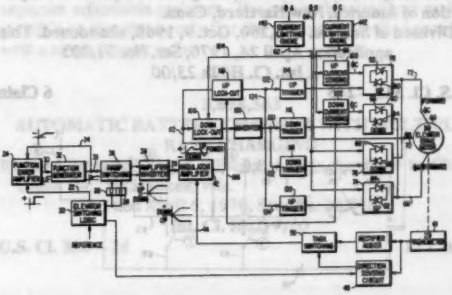
CONTROL FOR THREE PHASE A.C. MOTOR

Jiri B. Bucek, and James R. Shultz, both of York, Pa., assignors to Fincor Inc., York, Pa.

Filed Aug. 11, 1970, Ser. No. 62,869

Int. Cl. H02p *1/40*

U.S. Cl. 318—203 R **25 Claims**



A control for a three phase A.C. motor elevator drive in which direction and desired speed signals, as dictated by customer and user demand, are electronically processed to provide intermediate ramp control signals. A summing circuit which utilizes the intermediate ramp control signal and a signal from an elevator motor speed and direction sensing circuit has an output which determines and controls the voltage input, via electronic trigger controls to thyristor controlled power and reversing switching circuits in at least two channels of the three phase A.C. input to a three phase A.C. drive motor. The motor control circuit incorporates a high rate of off-on and phase reversing switching with phase angle control of voltage and current to provide interrelated variable A.C. power supply for both drive and braking of the elevator drive motor in both directions of movement of the elevator cab.

3,678,356

FREQUENCY RESPONSIVE ELECTRICAL CIRCUIT

William F. Van Ostrand, Hagerstown, Ind., assignor to Dynamic Precision Controls Corporation, Hagerstown, Ind.

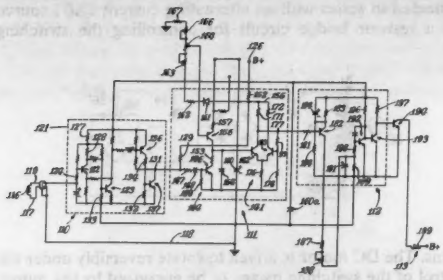
Filed Sept. 26, 1967, Ser. No. 670,703

Int. Cl. H02p *5/06*

U.S. Cl. 318—341 **6 Claims**

This disclosure deals with an electrical circuit designed to receive a train of input signals and produce an output signal that is indicative of the frequency at which the input signals

are received. When the frequency of the input signals is below a critical value, the output signal is in the form of pulses having a width which is proportional to the input signal frequency, and when the input signal frequency is above this critical value, the output signal is zero.



3,678,357

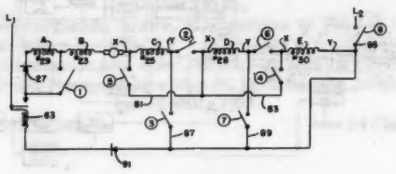
MULTIPLE PUSH BUTTON SWITCH SPEED CONTROL SYSTEM

Roy L. Swanke, Newington, and Gordon H. Raymond, Southington, both of Conn., assignors to Dynamic Corporation of America, New Hartford, Conn.

Division of Ser. No. 766,280, Oct. 9, 1968, abandoned. This application April 24, 1970, Ser. No. 31,803

Int. Cl. H02k *23/00*

U.S. Cl. 318—245 **6 Claims**



A speed control system for a universal electric motor wherein field windings on one side of the armature are permuted by contacts of a multiple push button switch into a predetermined number of different series and parallel interconnections to achieve a maximum number of significantly different motor operating speeds with a minimum number of switch contacts. The number of speeds thus available is preferably doubled by selectively switching an additional diode and field winding into the field circuit, and a series switch contact is further provided in this circuit to interrupt current flow therein while the winding interconnections are being permuted to reduce the maximum current carried by the permutation switch contacts.

3,678,358

BRUSHLESS DC ADJUSTABLE SPEED DRIVE WITH STATIC REGENERATIVE DC MOTOR CONTROL

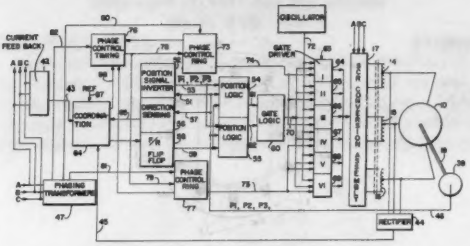
Edwin E. Kolatorowicz, Erie, Pa., assignor to General Electric Company

Filed July 14, 1970, Ser. No. 54,703

Int. Cl. H02k *29/00*

U.S. Cl. 318—254 **3 Claims**

For a brushless direct current motor there is provided a static adjustable speed control circuit including an SCR converter for controlling the average voltage applied to the motor windings by phase control of current flowing directly from a multi-phase power source and for commutating the current through the motor winding to maintain the proper current flow direction and torque. The SCR converter is controlled as a function of rotor position, a-c line input conditions, phase advance and SCR converter voltage output. A voltage feedback signal from the converter output is compared to a reference voltage to derive a comparison signal used to adjust the phase advance and thereby control the average voltage applied to the motor terminals. The polarity of the comparison signal determines whether motoring action or regeneration is to occur. Current feedback from the input lines is used to prevent combinations of SCRs from "turning on" and short circuiting the load.



3,678,359

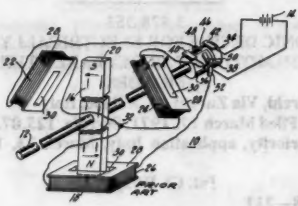
DIRECT CURRENT MOTOR HAVING IMPROVED COMMUTATION MEANS

Donovan F. Peterson, 655 Meadow Lane, Elm Grove, Wis.

Filed Dec. 21, 1970, Ser. No. 100,061

Int. Cl. H02k *29/02*

U.S. Cl. 318—254 **5 Claims**



A direct current motor of the type having a bar magnet rotor utilizes magnetic reed switches as a commutation means. The reed switches are operable by the bar magnet rotor to effect commutation of the motor.

3,678,360

MOTOR SPEED CONTROL WITH TRANSFORMER FEEDBACK MEANS

William J. Minarik, Los Angeles, and Raymond J. Mason, Lynwood, both of Calif., assignors to Minarik Electric Company, Los Angeles, Calif.

Filed Feb. 2, 1970, Ser. No. 7,740

Int. Cl. H02p *5/16*

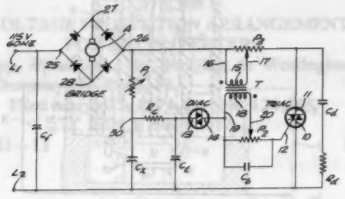
U.S. Cl. 318—332 **17 Claims**

A power supply circuit including a Triac for controlling the initiation of current flow to the load during each half-cycle. Firing of the Triac is directly controlled by a diac, and during each half-cycle the firing of the diac is controlled by a timing capacitor which is charged first in one direction and then in the other by current flowing from the alternating current source.

In one form of the circuit the exact firing point of the diac (and hence of the Triac) is also influenced by a feedback transformer which derives a regenerative feedback voltage from the current flowing through the Triac, and which operates when the Triac current increases to advance the point at which the Triac fires.

In another form of the circuit a regenerative feedback voltage is achieved without the use of a transformer, using Zener diodes for line voltage regulation and a number of resistors and capacitors suitably connected in the circuit.

The circuits are illustrated as supplying current to an electric motor, which requires an increase in operating voltage in order to maintain the motor speed constant when the mechanical load on the motor increases.



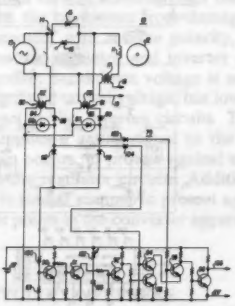
The purpose of the above abstract is to provide a non-legal technical statement of the disclosure of the contents of the instant patent application and thus serve as a searching-scanning tool for scientists, engineers and researchers. Accordingly, this abstract is not intended to be used in understanding or otherwise comprehending the principles of the present invention hereinafter described in detail, nor is it intended to be used in interpreting or in any way limiting the scope or fair meaning of the claims appended hereto.

3,678,361

STARTING CONTROL FOR AN A.C. ELECTRIC MOTOR DEVICE

Hideomi Takahashi, Tokyo, and Katsuhiko Takigami, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaski, Kanagawa-ken, Japan

Filed July 23, 1971, Ser. No. 165,559
Claims priority, application Japan, July 25, 1970, 45/64798
Int. Cl. H02h 7/09
U.S. Cl. 318—473 **4 Claims**



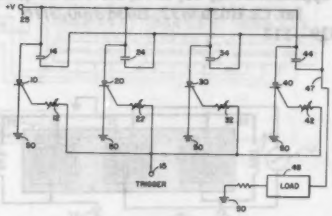
An electric motor is connected to an A. C. voltage supply through a thyristor switching device and is started by the full voltage starting method. In order to prevent the thyristors in the thyristor switching device from a burn-out due to an excessive starting current, the thyristor switching device is controlled to be intermittently turned off during the starting period of the motor under the control of a thyristor temperature rise anticipation circuit. The thyristor switching device is also controlled to be intermittently turned on during the starting period under the control of a thyristor temperature fall anticipation circuit and a synchronous indicating circuit.

3,678,362

SOLID STATE PULSER USING PARALLEL STORAGE CAPACITORS

Donald J. Amberger, Hauppauge, and Robert A. Celentano, Huntington, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army

Filed Sept. 17, 1970, Ser. No. 72,954
Int. Cl. H02m 3/10, 3/18; H03k 3/57
U.S. Cl. 320—1 **7 Claims**



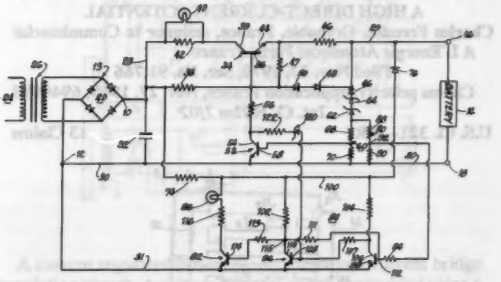
A solid state pulse generator that produces high current narrow pulses and includes a bank of parallel silicon controlled rectifier-capacitor combinations, designed for driving a gallium arsenide diode laser. A trigger circuit is connected to all the gate circuits of the silicon controlled rectifiers, through separate adjustable resistors. The adjustable resistors make it possible to simultaneously fire the silicon controlled rectifiers with a single trigger pulse.

3,678,363

AUTOMATIC BATTERY CHARGER WITH MULTIPLE RATE CHARGING

Richard Bertrem Ringle, Milwaukee, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed April 6, 1970, Ser. No. 25,916
Int. Cl. H02j 7/10
U.S. Cl. 320—24 **13 Claims**



A battery charging circuit is disclosed having a multiple mode program of operation for fully automatic battery charging. In a first mode a rectified power supply provides a constant charging current flow to the terminals of a substantially discharged battery. In a second mode, initiated when a prescribed minimum charge is reached, the flow of charging current and the resultant rate of charge are reduced as the battery terminal voltage approaches a certain percentage of full charge. In a third mode, initiated at a prescribed intermediate voltage, charging continues through an unregulated rectified power supply until a maximum terminal voltage is reached. The unregulated current supply is cut off when the maximum voltage is reached, and the limited current supply comes back on in a fourth standby mode which impresses a float voltage upon the battery. This mode continues until the battery is

discharged below the prescribed minimum voltage or another battery is connected to the charging circuit, at which time the program is automatically repeated.

3,678,364

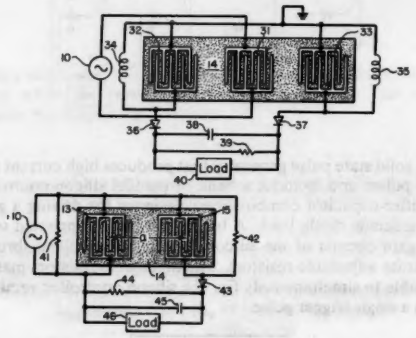
SURFACE WAVE DEVICES

Adrian J. De Vries, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 721,038, April 12, 1968, Continuation-in-part of Ser. No. 582,387, Sept. 27, 1966, abandoned. This application May 18, 1971, Ser. No. 144,501

Int. Cl. H03h 9/32; H03d 3/00, 3/16

U.S. Cl. 329—117 3 Claims



An acoustic filter for use in an FM receiver includes a body of piezoelectric material propagative of acoustic surface waves, a pair of surface wave interaction devices and a diode arranged as a discriminator.

3,678,365

WAVEGUIDE DEVICE FOR BRINGING AN ELEMENT TO A HIGH DIRECT-CURRENT POTENTIAL

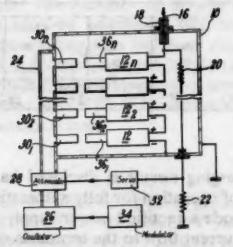
Charles Fremiot, Grenoble, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Nov. 23, 1970, Ser. No. 91,766

Claims priority, application France, Nov. 27, 1969, 6940998

Int. Cl. H02m 7/02

U.S. Cl. 321—8 R 13 Claims



A DC high voltage source comprising a plurality of modules whose outputs are connected in series ending relation and each having a microwave receiving antenna and a rectifier, each receiving antenna is couplet with a respective transmitting antennae fed by a magnetron through a waveguide. The microwaves are preferably modulated at radiofrequency and each module then comprises a step up transformer.

3,678,366

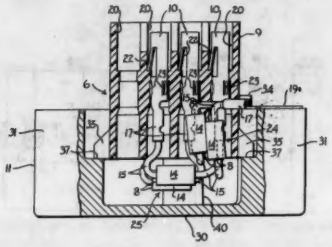
RECTIFIER NETWORK ASSEMBLY

Paul A. Tharman, Milwaukee, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed July 30, 1971, Ser. No. 167,691

Int. Cl. H02m 7/00

U.S. Cl. 321—8 R 5 Claims



In a rectifier assembly comprising diodes that have wire terminals projecting axially in opposite directions from a cylindrical body, permanent connections between diode terminals comprise crimp connectors integral with terminal members such as plug jacks. The terminal members are seated in bores in a plug body which is partway received in an open topped metal casing. The casing is filled with epoxy that embeds the diodes, their connections with the terminal members and part of the plug body.

3,678,367

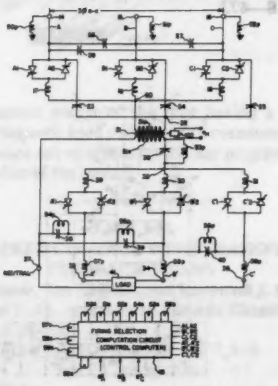
VERSATILE POWER CONVERTERS WITH A HIGH FREQUENCY LINK

William McMurray, Schenectady, N.Y., assignor to General Electric Company

Filed May 26, 1971, Ser. No. 146,863

Int. Cl. H02m 5/30

U.S. Cl. 321—7 37 Claims



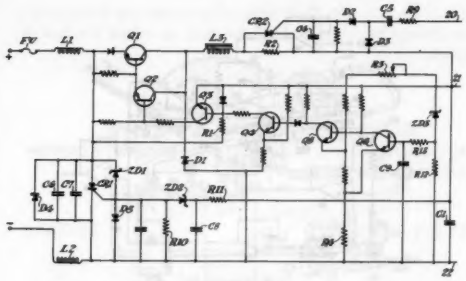
A power converter circuit with a high frequency transformer or capacitor link between input and output switching circuits is operated by a control computer to provide voltage, frequency, and phase conversion and regulation. Each switching circuit has a plurality of solid state switches establishing multiple circuit paths from the input to the output terminals through the single phase high frequency link by conduction of different combinations of switches. Selected combinations of switches are fired synchronously at a high frequency switching rate to generate a series of energy transfer pulses. The control computer operates immediately in advance of each energy transfer pulse to calculate the net ef-

fective error, according to a predetermined criterion, between the instantaneous predicted output voltage (or current) and the desired or reference output voltage for each possible combination of switches. The combination that produces the minimum net effective error is selected and fired next. Single phase AC, polyphase AC, and DC input and output switching circuit configurations can be combined as desired.

3,678,368
OVERVOLTAGE PROTECTION ARRANGEMENT FOR POWER CONVERTERS

Ralph Popp, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed March 15, 1971, Ser. No. 124,365
Int. Cl. H02m *1/18*
U.S. Cl. 321—11 **1 Claim**



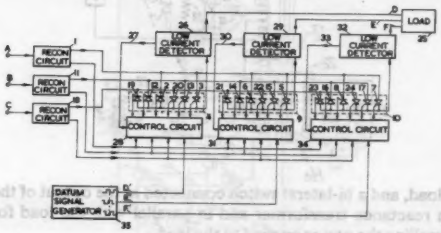
A controlled rectifier is connected in multiple across a non-regulated d.c. source which supplies operating energy to a transistorized d.c. to d.c. converter apparatus. Also connected across the source, oppositely poled, is a Zener diode with a reverse breakdown voltage greater than the normal source voltage but less than the breakdown potential which damages the transistors in the voltage regulator portion of the converter. A gating signal is applied to the controlled rectifier if Zener diode breakdown occurs due to a sustained increase in source voltage. A fuse interrupts the leads from the source when the resulting high current flows through the controlled rectifier and protects the transistors from damage. Another Zener diode is connected, with reverse polarity, across the connections between the regulator and inverter portions of the converter. Its reverse breakdown voltage is selected just above the normal regulated output voltage, but low enough to protect the transistors in the inverter circuits. This second Zener diode also supplies a gating signal to the controlled rectifier, if breakdown occurs, to protect against an overvoltage due to a fault in the regulator circuits. Additional Zener diodes may be used in similar manner to protect against overvoltage faults at other points in the converter apparatus.

3,678,369
CYCLOCONVERTERS

Reginald John Kingston Splatt, Farnham, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 21, 1970, Ser. No. 82,779
Claims priority, application Great Britain, Oct. 24, 1969, 52,193/69
Int. Cl. H02m *5/30*
U.S. Cl. 321—69 R **7 Claims**

A cycloconverter with a supply voltage reference signal generator, a datum signal generator, and variable period timing circuits each triggered by an output of the reference signal generator and each operating for a period determined by an output of the datum signal generator. Trigger circuits are controlled by the timing circuits and controlled rectifiers, rendered conductive by trigger signals from the trigger circuits, transmit power from an AC supply to one or more output lines to form a supply at another frequency. Low current detectors in each output line and gating circuits responsive to

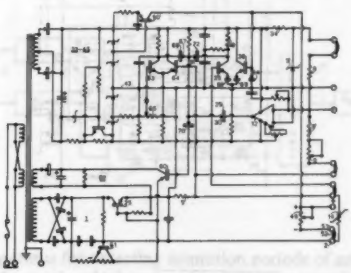


an output of the datum signal generator and one of the low current detectors ensure that the trigger signals are not applied to any of the rectifiers when the current flowing in the output line supplied by them is less than a predetermined value or of the opposite polarity to the current which they are connected to conduct.

3,678,370
VOLTAGE LIMITING CIRCUIT FOR CONSTANT CURRENT POWER SUPPLIES

Joseph R. Gately, Woodside, N.Y., assignor to Forbro Design Corp., New York, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,416
Int. Cl. G05f *1/58*
U.S. Cl. 323—4 **1 Claim**



A current regulated power supply employs a current bridge regulating circuit. A voltage limiting circuit is provided using a voltage comparison circuit drawing negligible current so that the current regulation is substantially undisturbed. A back-up current limiter is provided to limit output current in case of malfunction of the main current regulator.

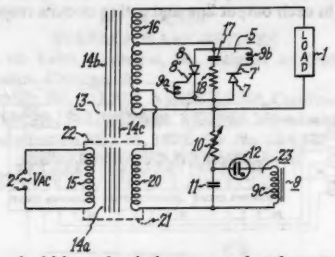
3,678,371
LAMP CONTROL CIRCUIT WITH HIGH LEAKAGE REACTANCE TRANSFORMER AND CONTROLLED BILATERAL SWITCHING MEANS

Joe A. Nuckolls, Hendersonville, N.C., assignor to General Electric Company

Filed Nov. 25, 1968, Ser. No. 778,687
Int. Cl. H05b *41/38*
U.S. Cl. 323—6 **3 Claims**

Load power control device for control of the operation of gaseous discharge lamps or other loads comprises a high

reactance transformer having the primary connected to an alternating current voltage source, a secondary connected to



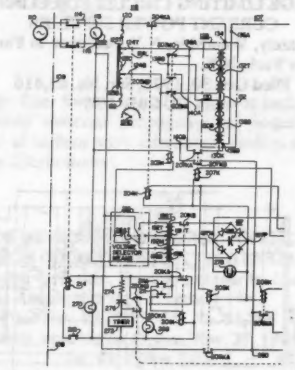
the load, and a bi-lateral switch connected at the output of the high reactance transformer and in parallel with the load for controlling the power applied to the load.

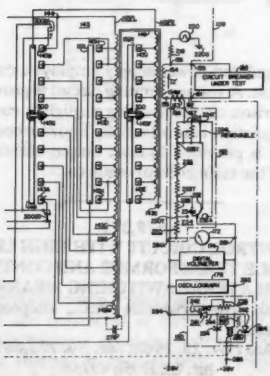
3,678,372

PORTABLE CIRCUIT BREAKER TESTER FOR CALIBRATING A CIRCUIT BREAKER OVER A WIDE RANGE OF CURRENT

Frederick A. Elder, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed April 7, 1970, Ser. No. 26,196
Int. Cl. G05f 1/24
U.S. Cl. 323—45 **5 Claims**





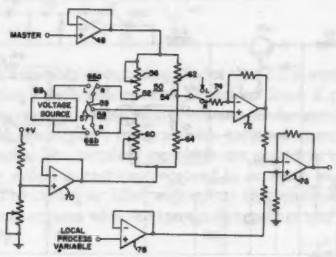
A tester for circuit breakers in which the tapped primary of a power transformer is used in conjunction with the secondary of a voltage boosting transformer controlled by a variable transformer to generate current in the circuit interrupter to be tested. The range of current is continuously variable from zero to approximately 50,000 amperes. A device for measuring the duration of the current in the circuit interrupter is provided and a means for measuring quick surges of current which immediately trip a faulty or overloaded circuit interrupter is provided to determine duration of breaker engagement and maximum current flowing before interruption.

3,678,373

RATIO CONTROLLER WITH ZERO RATIO CAPABILITY

John Edward Riley, Saugus, Mass., assignor to General Electric Company

Filed Nov. 27, 1970, Ser. No. 93,156
Int. Cl. G01r 17/14
U.S. Cl. 323—75 N **8 Claims**



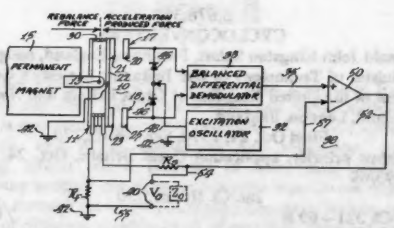
A ratio controller having circuitry for establishing a zero ratio. A master signal provided by a master controller is applied to the upper end of a bridge circuit consisting of two parallel branches. The first branch includes a series-connected potentiometer winding. The second branch includes two series-connected resistors. The ratio of impedances in the second branch can be made equal to the ratio of impedances in the first branch taken between the nominal zero setting of the potentiometer and the upper and lower ends, respectively, of the bridge circuit. An amplifier has a first input connected to the potentiometer tap and a second input connected to the junction of the resistors in the second branch. The output of this amplifier represents the setpoint at which the local process variable should be maintained.

3,678,374

SERVOED TRANSDUCER SYSTEM WITH CURRENT OUTPUT CIRCUIT

Burton J. Thompson, Mount Lake Terrace, Wash., assignor to Sundstrand Data Control, Inc.

Filed Jan. 6, 1970, Ser. No. 966
Int. Cl. G05d 13/62, 15/01
U.S. Cl. 323—90 **15 Claims**



A servoed transducer uses differential sensing capacitors connected to a detector circuit to generate an error signal proportional to movement of a pivoted seismic mass. The error

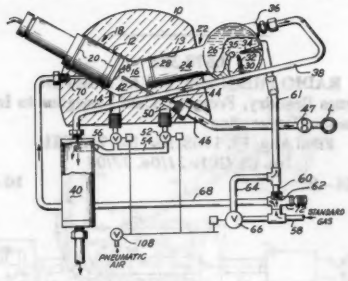
signal is amplified by a servo amplifier with closed loop feedback in order to maintain for a fixed error signal a constant current through a torque coil which rebalances the seismic mass. The servo amplifier output circuit presents zero impedance to an external load.

3,678,375

ELECTRONIC APPARATUS FOR ACCURATELY MONITORING AND RECORDING THE PARTIAL PRESSURE OF A GAS

Otho K. McFarland, Glencoe, and James F. Tamburrino, Chicago, both of Ill., assignors to Abbott Laboratories

Filed Sept. 24, 1969, Ser. No. 4,789
Int. Cl. G01n *27/42*
U.S. Cl. 324—29 **5 Claims**



An electronic apparatus for continuously metering and recording the partial pressure of CO_2 including a voltage sensitive meter and recorder. The meter is adapted to receive and read voltage generated by an electrode representative of the partial pressure of CO_2 in a stream of liquid introduced to the electrode. The recorder is adapted to record the voltage output from the meter together with a compensating voltage or in the alternative to record a pre-determined voltage which may be set independently of the voltage output of the meter. Electronic circuitry allows the recorder to automatically monitor the electrode voltage together with a compensating voltage. The circuitry also allows the periodic recalibration of the voltage supplied to the recorder. The calibration and monitoring of the partial pressure of CO_2 may be done either manually or automatically. The electronic circuitry generally includes resistive networks, power supplies, time delay units, solenoid coils and associated relays.

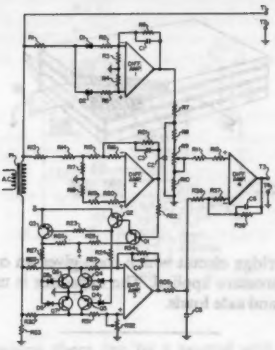
3,678,376

ARRANGEMENT FOR TESTING BREAKDOWN OF THE INSULATION OF A CONDUCTOR UTILIZING AN ALTERNATING CURRENT CIRCUIT TO ELIMINATE STRAY CAPACITANCE EFFECTS

Dale R. Jaster, Northlake, and James S. Nasby, Chicago, both of Ill., assignors to GTE Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Dec. 14, 1970, Ser. No. 97,826
Int. Cl. G01r *31/14*
U.S. Cl. 324—54 **4 Claims**

A circuit for testing breakdown conditions of insulation in networks or circuitry where substantial amounts of stray capacitance exist between the conductor under test and return paths such as ground. Measurement of real current flowing through the network under test permits high speed testing without concern for stray capacitance effects.

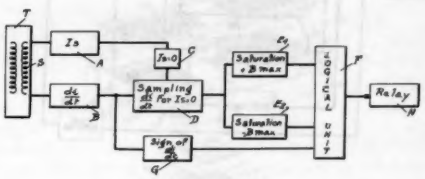


3,678,377

APPARATUS FOR DETECTING SATURATION PERIODS OF A TRANSFORMER

Alain Chiffert, Jouy-en-Josas, France, assignor to Compagnie Des Compteurs, Paris, France

Filed Dec. 8, 1970, Ser. No. 96,182
Claims priority, application France, Dec. 11, 1969, 6942943
Int. Cl. G01r *31/06*
U.S. Cl. 324—55 **7 Claims**



An apparatus for detecting saturation periods of an electrical transformer in which successive derivative samples of the current flowing in the transformer are compared when the current traverses a zero datum, the signs of the respective derivative samples are also detected, and a logical circuit controlled by the derivative samples as well as their signs functions to produce logic signals of one state or another, i.e., 1 or 0 depending upon whether or not the transformer is saturated.

3,678,378

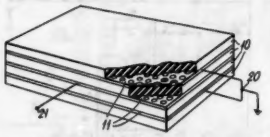
CAPACITORS

John James Trott, Bracknell, and James William Grainger, Camberley, Surrey, both of England, assignors to National Research Development Corporation, London, England

Filed March 28, 1969, Ser. No. 811,513
Claims priority, application Great Britain, April 4, 1968, 16,316/68
Int. Cl. G01r *27/26*; H01g *7/00*
U.S. Cl. 324—61 R **9 Claims**

A capacitor is described, the capacity of which varies with pressure applied thereto. The capacitor may have sheet metal electrodes separated by natural rubber layers, one at least of

the electrodes being perforated so that when pressure is applied to the capacitor the rubber can deform and the electrodes can move closer together. The capacitor may be connected in a bridge circuit which then gives an output dependent on the pressure applied. The capacitor is useful in measuring wheel and axle loads.



3,678,379

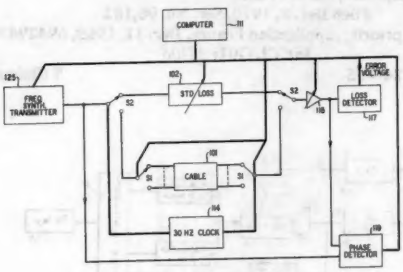
COMPUTER CONTROLLED MULTICONDUCTOR COMMUNICATION CABLE TESTING SYSTEM

Frank Joseph Arvay, Scotch Plains; George Frieber, Basking Ridge; Joseph William Lechleider, Colts Neck, and Robert Anderson Sutton, Whitehouse, all of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 4, 1970, Ser. No. 95,029

Int. Cl. G01r *27/00, 15/12*

U.S. Cl. 324—73 **5 Claims**



Automatic sequential testing of the transmission characteristics of the conductors in a multipair communication cable is effected by the use of computer techniques to provide programming and initiation of switching sequences. A standard loss comparison technique is implemented by fast acting connector mechanisms and high isolation switch matrices.

3,678,380

MEASURING DEVICE FOR USE IN MOVING BODIES FOR NAVIGATION PURPOSES TO DETERMINE THE CHANGE OF ORIENTATION THEREOF

Klaus Dieter Erben; Walter Kroy, and Walter Erich Mehnert, all of Munich, Germany, assignors to Messerschmitt-Bolkov-Blohm GmbH, Munich, Germany

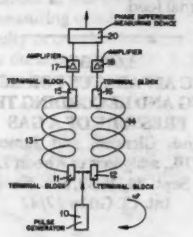
Filed Feb. 9, 1970, Ser. No. 9,484

Claims priority, application Germany, Feb. 17, 1969, P 19 07 838.7

Int. Cl. G01r *25/00;* H03d *13/00*

U.S. Cl. 324—83 A **3 Claims**

Orientation or a change of orientation measuring device for navigation purposes particularly in aircraft and spacecraft. The device utilizes a pair of superconductors wound in coil form connected at one end to a pulse generator and at the other end to a phase difference measuring device. The apparatus utilizes the Sagnac effect derived from the phase difference of the pulses at their output for measuring the orientation or change in orientation of the craft on which the device is carried.



3,678,381

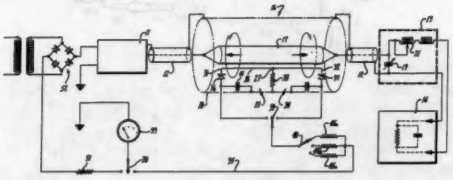
RADIO FREQUENCY WATTMETER

Harvey James Beaudry, Fremont, Calif., assignor to International Plasma Corporation

Filed Aug. 19, 1968, Ser. No. 753,681

Int. Cl. G01r *21/04, 27/04*

U.S. Cl. 324—95 **10 Claims**



A wattmeter for measuring the power delivered by a generator operating at a radio frequency, to a load of variable impedance through a coaxial transmission line, wherein the wattmeter is designed for accurate operation when the load is free from capacitive and inductive reactance as evidenced by the wattmeter indicating zero reflected power.

3,678,382

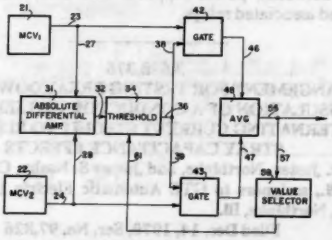
MALFUNCTION DETECTION CIRCUIT AND METHOD

Robert I. Klein, Hialeah, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed April 9, 1970, Ser. No. 27,007

Int. Cl. G01r *7/00*

U.S. Cl. 324—140 R **11 Claims**



In order to detect a malfunction in one or both of two parallel channels carrying the same data, in a dynamic manner, the absolute differential value of the outputs of these two channels

is determined and such absolute differential value is compared with a threshold value which is a pre-selected percent of the average value of the output from the two channels. If the absolute differential value is less than the threshold value, the average output is coupled to an output line; however, whenever the absolute differential value exceeds the threshold value, all data is rejected and there is no output.

3,678,383

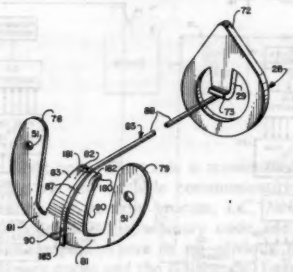
HIGH IMPACT WITHSTANDING TAUT BAND SUSPENSION INSTRUMENT

Willem J. L. Boreas, Sayreville, N.J., assignor to Weston Instruments, Inc., Newark, N.J.

Continuation-in-part of Ser. No. 836,828, June 26, 1969, Pat. No. 3,624,505. This application May 3, 1971, Ser. No. 139,513

Int. Cl. G01r *1/00*

U.S. Cl. 324—154 R **8 Claims**



In a taut band suspension instrument in which each taut band extends between two convex support surfaces and the end portions of the taut band are secured to the respective supports by fused metal connections at points spaced radially from the axis defined by the band, the support surface at the end of the band farther from the rotor is provided with a shallow groove, the bottom of the groove being continuous and uninterrupted and having a width at least twice the width of the taut band, the support surface at the other end of the band being smooth and unbroken for the full width thereof. The combination of the two support surfaces allows the taut band to shift laterally when the instrument is under shock, yet assures that the outer end of the taut band will be properly oriented when installed and thereafter.

3,678,384

ELECTRON BEAM APPARATUS

Charles W. Oatley, Cambridge, England, assignor to Cambridge Scientific Instruments Limited, Cambridge, England, a part interest

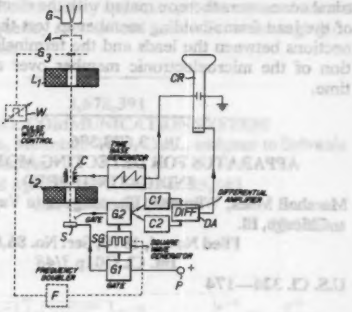
Filed Aug. 25, 1969, Ser. No. 852,710

Claims priority, application Great Britain, Aug. 24, 1968, 40,560/68

Int. Cl. G01r *31/22, 15/12*

U.S. Cl. 324—158 R **13 Claims**

In electron beam apparatus in which an electron beam is caused to impinge on a specimen surface and the resulting secondary electrons are analyzed to show the distribution of electric potential on the surface, the potential on the surface is switched rapidly on and off or the potential on a grid between the specimen and collector is switched rapidly between two levels, and the signals from the collector in the two conditions are directed into two channels, from which the difference signal is used to show the potential of the surface, largely independent of topography and other factors. The beam itself can also be switched on and off at double the switching frequency.



In the grid version there can be a second grid to shield the specimen from the switched grid.

3,678,385

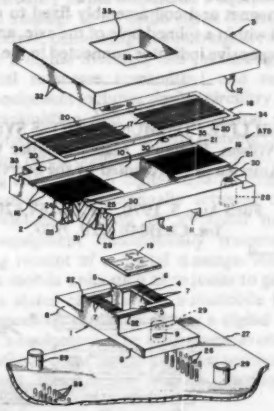
ASSEMBLY AND TEST DEVICE FOR MICROELECTRONIC CIRCUIT MEMBERS

Peter Martin Bruner, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 26, 1969, Ser. No. 861,274

Int. Cl. G01r *31/22*; H05k *1/00*

U.S. Cl. 324—158 F **1 Claim**



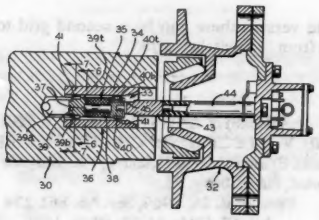
An assembly and test device for microelectronic circuit members has a circuit-holding member provided with an area in which a microelectronic circuit member is disposed and grooves are in communication with the area. A lead frame-holding member has an opening in which the circuit-holding member is positioned and it has grooves for receiving leads of a lead frame, these grooves being disposed in alignment with the grooves of the circuit-holding member when the holding members are latchably secured together. A pressure-applying member is latchably secured onto the lead frame-holding member and it is provided with ribs that are mateable with the aligned grooves of the circuit-holding and lead frame-holding members so that ends of the leads are held in engagement with terminals of the microelectronic member in order that the ends of the leads can be soldered or welded onto the terminals, the ribs also hold the leads in engagement with electrical connectors of the lead frame-holding member. The lead frame-holding member with the circuit-holding member and

the pressure-applying member in position thereon after the leads have been connected to the terminals on the microelectronic member and the leads have been severed from the lead frame is connected as an assembly onto a test board with electrical connectors thereon mated with the electrical connectors of the lead frame-holding member to test the electrical connections between the leads and the terminals and the operation of the microelectronic member over a predetermined time.

3,678,386
APPARATUS FOR DETECTING MOTION AND INDICATING SPEED

Marshall Miles, Wilmette, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Nov. 4, 1970, Ser. No. 86,846
Int. Cl. G01p 3/48
U.S. Cl. 324—174 **5 Claims**

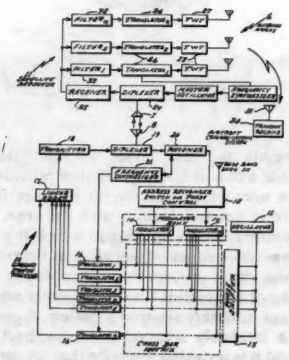


Apparatus for determining whether an axle on a railroad vehicle is locked and for determining axle speed including a permanent magnet and coil assembly fixed to a bearing box and arranged within a splined hole of the axle, and a voltage or frequency responsive indicator connected to the coil.

3,678,387
SATELLITE COMMUNICATIONS SYSTEM

Quintus C. Wilson, Sudbury, Mass., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Aug. 5, 1970, Ser. No. 69,520
Int. Cl. H04b 7/20, 7/00
U.S. Cl. 325—4 **1 Claim**

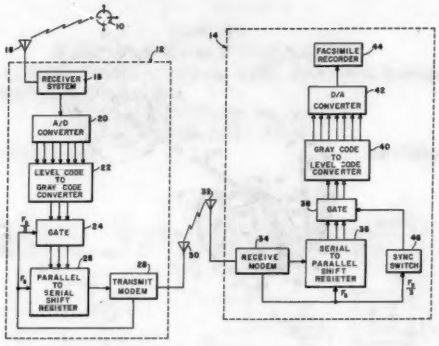


A ground-air communications system is disclosed that includes ground station processors, aircraft, and satellite borne repeaters. Satellite weight and power economies are achieved by scanning with repeater antennas. The preferred embodiment utilizes a phased array antenna having its antenna elements and amplifiers disposed in the satellite borne repeater and its phase shifting and modulating components disposed in the ground station processor. Phase shifted modulated carrier waves are translated in frequency prior to transmission from the ground station processor and are retranslated to their original frequencies by the repeater. Means are provided to lock transmitted and received carrier waves in phase and frequency.

3,678,388
GROUND STATION SYSTEM FOR RETRANSMITTING SATELLITE FACSIMILE SIGNALS OVER DIGITAL DATA LINKS

Reeve D. Peterson, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 14, 1970, Ser. No. 97,862
Int. Cl. H04b 7/20; H04n 1/00
U.S. Cl. 325—4 **2 Claims**



A ground station system for digitally processing automatic-picture-transmission (APT) pictures transmitted by earth-orbiting satellites whereby the processed pictures can be retransmitted over a digital data link to other remote receiving stations. At the transmit end of the system, APT pictures in the form of facsimile signals from satellites are sampled and gray-shade level quantized to produce a serial bit stream. The bit stream is re-transmitted over a digital data link to receiving stations where the received bit stream is suitably processed to thereby convert it to facsimile signals identical to the ones received directly from the satellite.

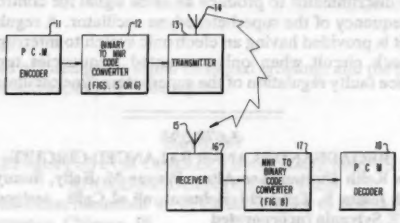
3,678,389
METHOD AND MEANS FOR MINIMIZING THE SUBJECTIVE EFFECT OF BIT ERRORS ON PCM-ENCODED VOICE COMMUNICATION

Arthur F. Heers, San Francisco, Calif., and William G. Schmidt, Rockville, Md., assignors to Communications Satellite Corporation

Filed Oct. 21, 1969, Ser. No. 868,145
Int. Cl. H04b 1/00
U.S. Cl. 325—38 R **13 Claims**

This disclosure concerns a method and a means for minimizing the subjective effect of bit errors on PCM-encoded voice communication. The input signal is assumed to be Laplace distributed with the words in the middle of the code occurring most often. A new code is formulated so that a single bit error in the mid ranges changes the sample level to a minimum degree. In the specific example presented, a seven-bit code having 128 sample levels is employed, with the 63rd and 64th levels bracketing the midpoint. The code word 0000000 is arbitrarily assigned to the 63rd level, and one of its nearest neighbors (words differing from it by a single bit)

1000000, is assigned to the 64th level. The six remaining or unassigned nearest neighbors of 0000000 are then assigned to levels 57 to 62, while the six other nearest neighbors of 1000000 are assigned to levels 65 to 70. Thereafter, the unassigned nearest neighbors of the level 62 word, 0000001, are assigned to levels 52 to 56, and so on, until the entire code word pattern is completed. Because of the manner in which the code, which has as yet no recognized name, is generated, it is designated in the disclosure as the "nearest-neighbor-rule" or simply "NNR" code. In order to facilitate the interface with existing PCM communication equipment, the straight binary code coming out of the PCM encoder is converted to the folded binary code, and the folded binary code is then converted to the NNR code. This code is transmitted through a receiving station via any suitable communications link and there decoded by the reverse process, i.e., NNR code to folded binary code to straight binary code and thence to message signal samples. There is no obvious relationship between the binary codes and the NNR code. For a seven-bit code, there are 128 possible combinations; however, the symmetrical properties of the folded binary code reduces the encoding and decoding problem to 32 possible combinations. Conversion between the straight binary code and the folded binary code may be performed serially or in parallel. Conversion between the folded binary code and the NNR code is accomplished by a decoding matrix which selectively reads the contents of one of 32 storage registers.



3,678,390

FREQUENCY MODULATION COMMUNICATION SYSTEM

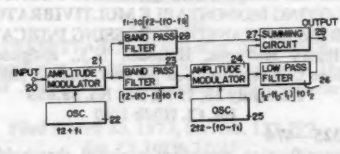
Masahiro Iwasaki; Nobuyuki Goto, both of Yokohama-shi; Hiroya Fujisaki, and Kunihiko Niwa, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Oct. 8, 1969, Ser. No. 864,670

Claims priority, application Japan, Oct. 11, 1968, 43/73748; Oct. 11, 1968, 43/73749

Int. Cl. H04b *1/62*

U.S. Cl. 325—46 **2 Claims**



The frequency modulation communication system modifies the frequency spectrum of transmission signals in transmission and reception so as to allow them to have desired characteristics, equivalently improves the signal-to-noise ratio (S/N ratio) and consequently improves the articulation of signals particularly associated with speech, thereby enabling a prescribed frequency band to be prominently compressed. For modification of the frequency spectrum, there are used means for inverting frequency spectra and means for rearranging or interchanging them.

3,678,391

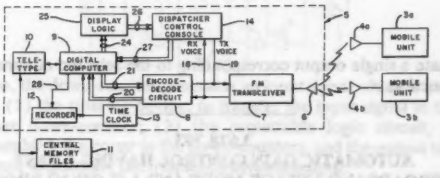
DIGITAL COMMUNICATION SYSTEM

Warren G. Gough, Mountain View, Calif., assignor to Sylvania Electric Products, Inc.

Filed April 6, 1970, Ser. No. 25,841

Int. Cl. H04b *1/00*

U.S. Cl. 325—55 **28 Claims**



The dispatcher's equipment and each mobile unit in a police patrol car has a standard frequency modulated (FM) transceiver for communicating with voice messages. Each mobile unit also has digital circuitry for identifying itself, selecting a prescribed digital code message, synchronizing its operation with that of circuitry in the dispatcher's equipment, converting the digital message to an audio signal for transmission by the FM transceiver, converting an audio signal received by the transceiver to a digital message, and presenting a visual display of digital messages transmitted and received. The dispatcher's equipment includes similar circuitry for selecting, displaying, transmitting and receiving digital messages. In order to synchronize transmitting and receiving circuitry, each receiving circuit resets counters in an associated clock circuit on the leading edge of each digital input having a high logic level. Each mobile unit is manually actuated to transmit a signal acknowledging receipt of a digital message. The dispatcher's equipment automatically transmits a signal acknowledging receipt of a digital message. Routine digital messages from mobile units such as requests to go off duty for lunch or for a status check on an automobile license plate number are processed automatically by a digital computer in the dispatcher's equipment. The assignment/availability status of mobile units and recent digital messages received therefrom and transmitted thereto are visually displayed on the dispatcher's equipment.

3,678,392

TV REMOTE CONTROL SYSTEM

Larry R. Houghton, St. Joseph, Mich., assignor to Whirlpool Corporation

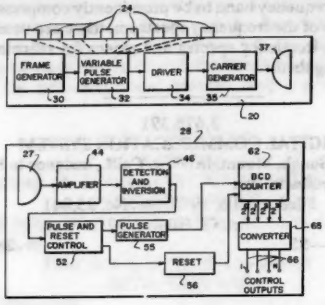
Filed Oct. 12, 1970, Ser. No. 80,021

Int. Cl. H04b *1/06;* **H04n** *5/44*

U.S. Cl. 325—392 **19 Claims**

A remote transmitter for controlling a television receiver generates a reference frame pulse of fixed time duration, which triggers a variable pulse generator. The width of the variable pulse is either incrementally or continuously adjustable to select different command functions. The pulse is coupled to a carrier generator which modulates a carrier or command signal of appropriate frequency for the remote control system. Since only a single carrier frequency is required for the whole system, operation may be limited to narrow band widths facilitating elimination of undesirable noise. A remote control receiver locally generates a series of high frequency

pulses proportional in number to the pulse width of the received remote control signal. The pulses are counted to actuate a single output corresponding to the selected command function.



3,678,393

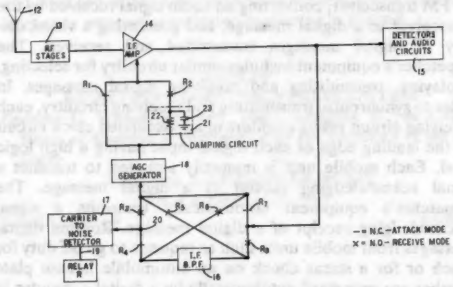
AUTOMATIC GAIN CONTROL HAVING A FAST BROADBAND ATTACK MODE AND A SLOW NARROW BAND RECEIVE MODE

John Anthony Newell, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 30, 1970, Ser. No. 76,819

Int. Cl. H04b 1/16

U.S. Cl. 325—410 **7 Claims**



An Automatic Gain Control (AGC) circuit having a fast broadband attack mode and a slow narrow band receive mode. A CODAN-like circuit is employed to judge the quality of the received signal. If the quality is poor, the AGC circuit responds to the total received energy. If the quality is good, a narrow band filter along with suitable damping is switched into the AGC loop so that it responds in a stable mode only to the received carrier energy.

3,678,394

SUPERHETERODYNE RECEIVER WITH AUTOMATIC TUNING TO A RECEPTION FREQUENCY

Martin Ebisch, Hohenschaeftlarn, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

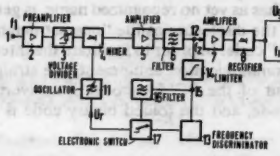
Filed March 23, 1970, Ser. No. 21,880

Claims priority, application Germany, March 24, 1969, P 19 14 919.0

Int. Cl. H04b 1/26

U.S. Cl. 325—423 **4 Claims**

A superheterodyne receiver having an automatic intermediate frequency control circuit with means to prevent the faulty regulation thereof. The receiver has means for receiving a radio frequency signal and mixing the same with the output of a superheterodyne oscillator. This produces an intermediate frequency signal which is coupled to a frequency or phase discriminator to produce an error signal for controlling the frequency of the superheterodyne oscillator. A regulation circuit is provided having an electronic switch to interrupt the feedback circuit when only unwanted frequencies tend to produce faulty regulation of the superheterodyne oscillator.



3,678,395

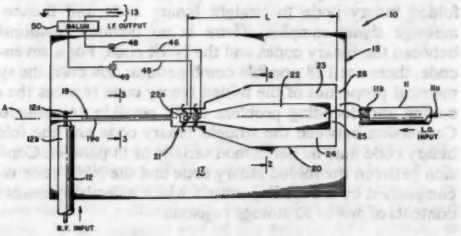
BROADBAND PLANAR BALANCED CIRCUIT

James Keith Hunton, Los Altos; Wayne M. Kelly, Sunnyvale, and James S. Takeuchi, Belmont, all of Calif., assignors to GTE Sylvania Incorporated

Filed Oct. 14, 1970, Ser. No. 79,906

Int. Cl. H03c 1/58; H04b 1/26

U.S. Cl. 325—446 **12 Claims**



A broadband planar balanced circuit comprising the junction of slot-line and coplanar-line transmission media. The coplanar and slot lines are formed on one side of a conductively covered dielectric sheet or substrate and are axially aligned. Integrated circuit diodes are connected across the junction and react with microwave energy propagating to the junction along the coplanar and slot lines. The intersection of these two lines has the characteristics of a hybrid junction necessary for the realization of microwave integrated circuit balanced mixers and is also applicable to broadband integrated circuit balanced frequency multipliers.

3,678,396

SIGNAL THRESHOLD CROSSING COUNTER EMPLOYING MONOSTABLE MULTIVIBRATOR TO SUPPRESS EXTRANEOUS CROSSING INDICATIONS

Harold Henry Hoffman, Holmdel, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

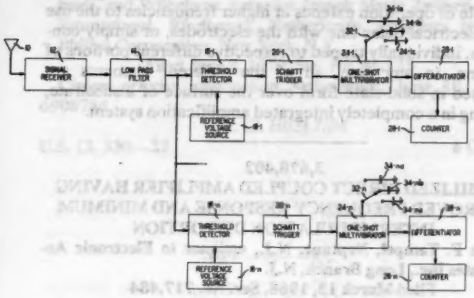
Filed July 28, 1970, Ser. No. 58,859

Int. Cl. H04b 1/10

U.S. Cl. 325—474 **3 Claims**

This specification describes a signal threshold crossing counter in which extraneous threshold crossing indications caused by high frequency noise signals accompanying an intelligence signal are suppressed by time domain filtering of the crossing indications. This time domain filtering is accom-

plished by means of an inhibiting or blocking monostable multivibrator having an internal time constant intermediate the



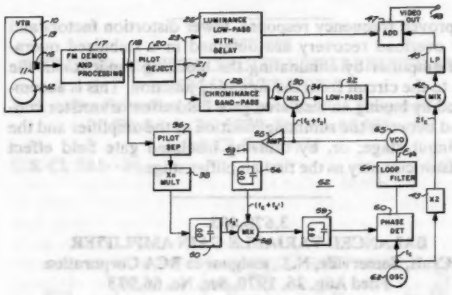
period of intelligence signal threshold crossings and the period of the accompanying noise signals.

3,678,397

APPARATUS FOR CORRECTING PHASE SHIFTS IN ANGLE-MODULATED SIGNALS

Bert H. Dann, Mountain View, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 31, 1969, Ser. No. 872,847
Int. Cl. H04b 1/26
U.S. Cl. 325—423 **3 Claims**



Apparatus for providing an output signal having an angular position which follows in a fixed relationship the angular position of an angle modulated input signal in which a first phase shift is imposed on the input signal during a preliminary processing thereof, in which a second phase shift corresponding to the first phase shift is imposed on a feedback of said output signal, and in which said output signal is produced in response to a process including a heterodyning of said input signal having said first phase shift and said feedback having said second phase shift.

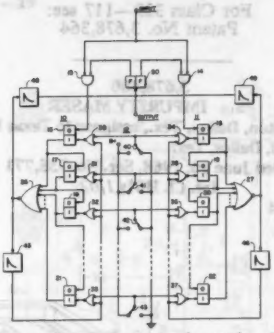
3,678,398

PRESETTABLE FREQUENCY DIVIDER

Kai E. Thomenius, Monmouth, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed March 23, 1972, Ser. No. 127,297
Int. Cl. H03k 21/32
U.S. Cl. 328—48 **2 Claims**

A frequency divider including two down-counters having common input and output terminals, an input signal steering device, and a presettable logic circuit. The latter includes a series of switches which are preset to establish a particular divisor by establishing an initial count in the down-counters. The steering device includes a pair of gates which steers the input signal to one of the two down-counters which in turn counts the cycles of the input signals. After counting down to



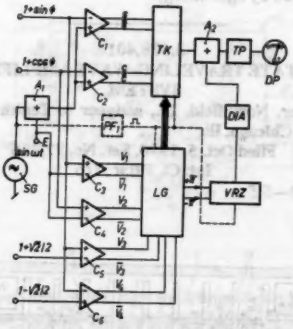
zero, the down-counter generates an input signal which is used by: (1) the steering device, to transfer the input signal to the other down-counter; (2) the presettable logic circuit, to reestablish the count in the down-counters, and the output terminal, to generate the frequency divided output.

3,678,399

METHOD OF AND APPARATUS FOR ELECTRONICALLY OBTAINING THE ARGUMENT OF A COMPLEX FUNCTION

Francois Mottier, Zurich, and Peter J. Wild, Wettingen, both of Switzerland, assignors to Brown, Boveri & Company Ltd., Baden, Switzerland

Filed Jan. 20, 1971, Ser. No. 108,078
Claims priority, application Switzerland, Jan. 22, 1970, 868/70
Int. Cl. H03d 13/00
U.S. Cl. 328—134 **13 Claims**



A method and apparatus are disclosed for precisely recovering the arbitrary argument of an output signal from a transducer having a sinusoidal transfer characteristic. The respective function values of the transducer output are continuously compared with a sinusoidally varying reference voltage of known angular frequency and amplitude. The angular frequency of the reference voltage is set sufficiently high so that the value of the transducer output signal does not change appreciably during a cycle of the reference voltage. The amplitude of the reference voltage is made equal to the maximum possible amplitude of the transducer output signal. From this comparison is derived electronically a pulse-width modulated signal, the width of each pulse being determined by the inter-

val between two points in time at which amplitude equality occurs between the transducer output and the reference voltage during each half-cycle of the reference voltage.

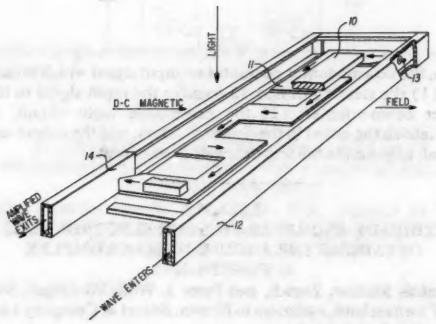
ERRATUM

For Class 329—117 see:
Patent No. 3,678,364

3,678,400
$^2S_{1/2}$ IMPURITY MASER

William C. Holton, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 10, 1968, Ser. No. 735,771
Int. Cl. H01s *1/02*
U.S. Cl. 330—4 22 Claims

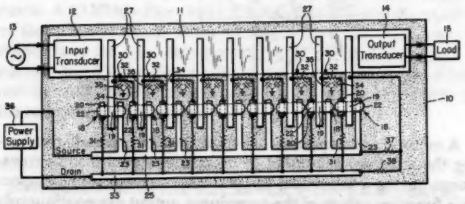


A maser is disclosed in which a predominantly optically transparent crystal of either single or polycrystalline characteristics is used, the crystal containing at sites of cubic symmetry ions having a $^2S_{1/2}$ ground state, an excited state, and a nonzero nuclear magnetic moment, and being mounted in a low temperature device, subjected to a magnetic field, and optically pumped by light energy.

3,678,401
SOLID-STATE TRAVELING-WAVE AMPLIFICATION SYSTEM

Robert Adler, Northfield, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 5, 1970, Ser. No. 77,956
Int. Cl. H03f *3/16*
U.S. Cl. 330—5.5 13 Claims

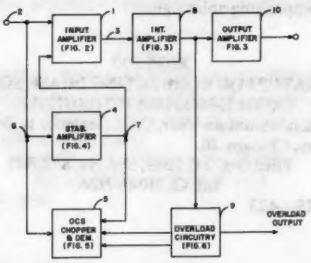


An input transducer launches acoustic surface waves along a piezoelectric propagating medium to an output transducer. An iterative series of solid-state amplifiers is disposed alongside the propagating medium. Associated with each amplifier is a signal delay device. A corresponding iterative series of electrodes, also spaced successively along the propagating medium, individually couple successive portions of that medium to respective ones of the amplifiers. Each electrode responds to wave energy in the medium for feeding an input signal to its associated amplifier and an adjacent electrode responds to the delayed output of that amplifier for producing a field in the medium that re-enforces the wave energy. The principle of operation extends at higher frequencies to the use of an electrical delay line with the electrodes, or simply conductors, individually tapped to respective different portions of that line. In any case, all of the different elements are deposited in solid-state form over the surface of a substrate, resulting in a completely integrated amplification system.

3,678,402
STABILIZED DIRECT COUPLED AMPLIFIER HAVING IMPROVED FREQUENCY RESPONSE AND MINIMUM INTERMODULATION DISTORTION

George F. Tempel, Neptune, N.J., assignor to Electronic Associates Inc., Long Branch, N.J.

Filed March 13, 1968, Ser. No. 717,484
Int. Cl. H03f *1/02*
U.S. Cl. 330—9 1 Claim

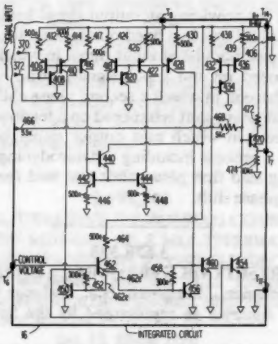

INPUT AMPLIFIER (FIG. 2)
INT. AMPLIFIER (FIG. 3)
OUTPUT AMPLIFIER FIG. 3
STAB. AMPLIFIER (FIG. 4)
OCS CHOPPER & DEM. (FIG. 5)
OVERLOAD CIRCUITRY (FIG. 6)
OVERLOAD OUTPUT

Improved frequency response, lower distortion factors and rapid overload recovery are obtained in a stabilized operational amplifier by eliminating the blocking capacitor at the input to the circuit from the summing junction. This is accomplished by having an insulated gate field effect transistor connected between the summing junction of the amplifier and the first input stage; or, by utilizing insulated gate field effect transistor circuitry as the first amplifier stage.

3,678,403
BALANCED VARIABLE GAIN AMPLIFIER

Jack Craft, Somerville, N.J., assignor to RCA Corporation

Filed Aug. 26, 1970, Ser. No. 66,973
Int. Cl. H03g *3/30*
U.S. Cl. 330—13 11 Claims

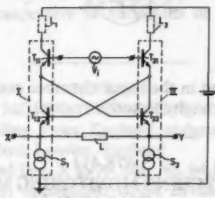


A balanced variable gain amplifier which can be gain controlled without disturbing the DC output level comprising, but not limited to, a complementary output stage characterized by a high signal-to-noise ratio suitable for fabrication on a monolithic semiconductor chip.

3,678,404
LINEAR AMPLIFIER CIRCUIT

Dirk Blom; Adrianus Johannes Wilhelmus Marie Van Overbeek, and Wilhelmus Antonius Joseph Marie Zwijsen, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 8, 1970, Ser. No. 44,133
Claims priority, application Netherlands, June 10, 1969, 6908784
Int. Cl. H03j 3/04
U.S. Cl. 330—22 6 Claims

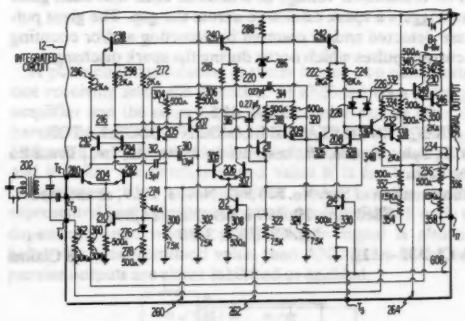


A linear amplifier circuit comprising two stages; each stage further comprising two transistors traversed in series by the same current. Cross coupling between the two stages avoid deviations from linearity of the amplifier due to differences in the base-emitter voltages of the transistors. The circuit is suitable for use in integrated circuits.

3,678,405
AMPLIFIER-LIMITER CIRCUIT WITH REDUCED AM TO PM CONVERSION

Jack Avins, Princeton, N.J., assignor to RCA Corporation

Filed Aug. 26, 1970, Ser. No. 66,921
Int. Cl. H03f 1/38
U.S. Cl. 330—26 6 Claims

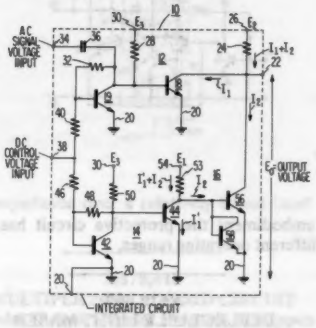


An amplifier-limiter circuit, having a plurality of translating stages, which utilizes positive feedback to obtain an essentially constant phase delay in each translating stage from low signal wave input levels to relatively high input signal wave levels, where each translating stage goes into limiting. As each translating stage goes progressively into limiting, with stronger signal waves, the effect of the positive feedback automatically decreases.

3,678,406
VARIABLE GAIN AMPLIFIER

Jack Avins, Princeton, N.J., assignor to RCA Corporation

Filed Aug. 26, 1970, Ser. No. 66,944
Int. Cl. H03g 3/30
U.S. Cl. 330—29 8 Claims

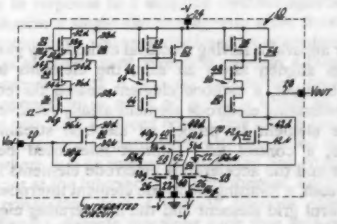


A variable gain direct current coupled amplifier having a fixed DC output level and suitable for fabrication on an integrated circuit chip.

3,678,407
HIGH GAIN MOS LINEAR INTEGRATED CIRCUIT AMPLIFIER

Richard Wilfred Ahrons, Somerville, N.J., assignor to RCA Corporation

Filed March 18, 1970, Ser. No. 20,522
Int. Cl. H03f 3/16
U.S. Cl. 330—35 12 Claims



A low power dissipation high load impedance metal-oxide semiconductor field-effect transistor (MOS FET) linear integrated circuit amplifier capable of operation at relatively low power supply voltages with high gain.

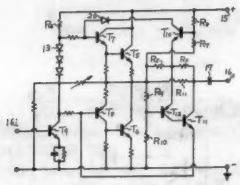
3,678,408
TRANSISTOR PROTECTIVE CIRCUIT

Tadao Suzuki, Toyko, Japan, assignor to Sony Corporation, Toyko, Japan

Continuation of Ser. No. 775,386, Nov. 13, 1968, abandoned.
This application Dec. 8, 1970, Ser. No. 96,287
Int. Cl. H03f 27/00, 1/38
U.S. Cl. 330—207 P 4 Claims

A protective circuit for a transistor which limits the maximum allowable collector power loss so as to prevent the transistor from being destroyed is disclosed. A second transistor is connected in circuit with the main transistor to

control the power loss in the main transistor. In one embodiment the protective transistor has a linear response and in another embodiment the protective circuit has a different slope in different operating ranges.

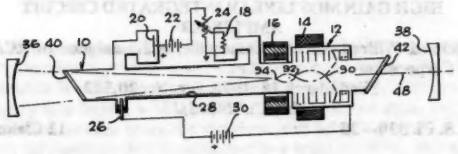


3,678,409

DEFLECTABLE LIGHT MASER

Marion S. Rose, Los Angeles, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 17, 1965, Ser. No. 514,723
Int. Cl. H01s *3/10*
U.S. Cl. 331—94.5 **14 Claims**



Laser apparatus having a coaxial cathode ray gun having its elements aligned along an axis, the elements including a heater element, a cathode element heated thereby, at least one accelerating electrode element axially removed from the cathode element to propel an electron stream from the cathode, a control grid element interposed between the cathode and the accelerating electrode elements in the electron stream, a focusing electrode element interposed between the control grid element and the accelerating electrode element, all of the elements being substantially symmetrical about the common axis and having apertures formed therein to clear an optical path in the region of said axis, the gun being surrounded and supported by a bulb having optical windows at both ends of the gun along the common axis, the bulb being filled with gas of a type to sustain laser action, and means for raising the energy of the gas in the region of the axis to a lasing threshold.

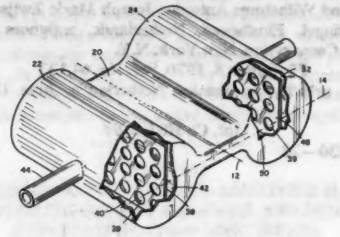
3,678,410

TRANSVERSE FLOW LASER CELL

Robert C. Kocher, Great Neck; Franklin K. Moore, Ithaca; Harold Samelson, Sea Cliff, and William R. Watson, College Point, all of N.Y., assignors to GTE Laboratories Incorporated

Filed Nov. 24, 1970, Ser. No. 92,354
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **7 Claims**

A laser cell for a transverse flow liquid laser has an active region in the form of a rectangular prism and cylindrical input and output chambers mounted in spaced-apart relationship in the transverse direction at opposite ends of the active region.



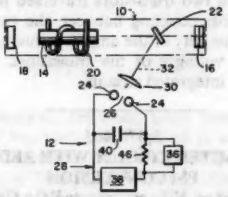
A baffle positioned in the input chamber causes the liquid to flow uniformly through the active region.

3,678,411

LASER Q-SWITCHING MONITORING METHOD AND APPARATUS

Durk J. Pearson, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Dec. 18, 1970, Ser. No. 99,355
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **11 Claims**



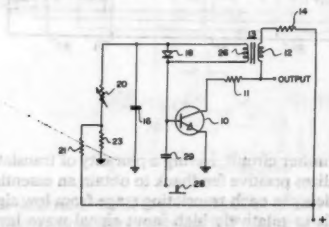
A method of and means for monitoring a Q-switching laser to detect and/or count giant Q-switched pulses emitted by the laser. At least a fraction of the light energy from the laser is focussed within a spark gap biased to a voltage slightly less than its breakdown voltage in a manner such that each giant pulse triggers a spark discharge across the gap. The giant pulses are detected and/or counted by detecting and/or counting the current pulses which occur during the spark discharges.

3,678,412

FREQUENCY STABLE BLOCKING OSCILLATOR

Rolf E. Spies, Lyons, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 873,942, Nov. 4, 1969, abandoned.
Filed Feb. 10, 1971, Ser. No. 114,391
Int. Cl. H03k *3/30*
U.S. Cl. 331—112 **8 Claims**



A frequency stable blocking oscillator using a timing capacitor to control the conduction of a transistor amplifier

includes a transformer having a primary winding connected to the collector electrode of the transistor and a secondary winding connected between the timing capacitor and the base of the transistor. Upon conduction of the transistor, the voltage induced in the secondary winding is applied to a diode connected to the capacitor to produce a bucking voltage in opposition to and proportional to the magnitude of the DC operating voltage supplied to the oscillator. This bucking voltage establishes the starting charge on the capacitor, with a reduced bucking voltage being applied to the capacitor for a drop in the operating voltage and with an increased bucking voltage being applied to the capacitor when the operating voltage rises, thereby stabilizing the frequency of operation of the oscillator irrespective of variations of the operating or supply voltage.

3,678,413

PULSE CODE MODULATION FEEDBACK ENCODERS

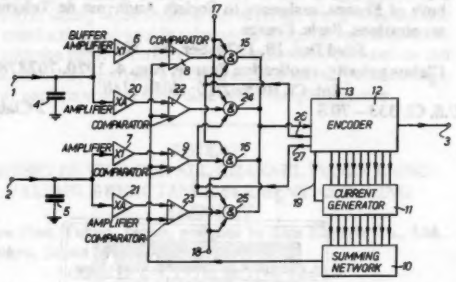
Peter John Wakeling, Essex, England, assignor to The Marconi Company Limited, London, England

Filed Dec. 3, 1970, Ser. No. 94,816

Claims priority, application Great Britain, Jan. 3, 1970, 344/70

Int. Cl. H03k *7/00*

U.S. Cl. 332—9 R **6 Claims**



A pulse code modulation encoder having two comparators, one receiving analogue signals to be encoded via a unity gain amplifier and the other arranged to receive signals after they have been amplified by a fixed amount. If the analogue signal is above a predetermined value it is fed to the one comparator and if below the predetermined value it is fed to the other comparator. The predetermined value is the voltage represented by the first amplitude digit of the P.C.M. code and dependent upon whether the analogue signal is above or below the predetermined value then AND gates in the comparator outputs are either inhibited or enabled.

3,678,414

MICROSTRIP DIODE HIGH ISOLATION SWITCH

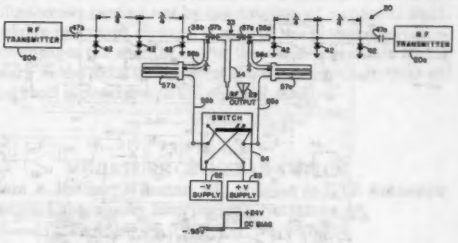
Ben R. Hallford, Dallas, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed Oct. 19, 1970, Ser. No. 81,943

Int. Cl. H01p *5/12*

U.S. Cl. 333—7 **17 Claims**

A shield enclosed microstrip circuit microwave multi-diode switch with undesired waveguide signal transmission minimized. Diodes are spaced and connective microstrip sections dimensioned for optimum signal isolation in the OFF state. Further, diode dc bias isolation is provided for multi-diode sections of such switches by signal path coupling capacitors, along with dc bias supply RF rejection filtering minimizing loss of signal power and that minimizes disturbance of



signal line impedance over a relatively broad band range of operation.

3,678,415

MULTIPLE PORT HYBRID CIRCUIT

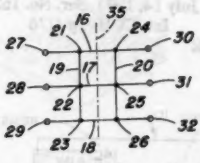
Takaji Kuroda, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed June 25, 1970, Ser. No. 49,650

Claims priority, application Japan, June 30, 1969, 44/51644

Int. Cl. H01p *5/12*

U.S. Cl. 333—9 **12 Claims**



A hybrid circuit adapted to transmit at least n electromagnetic waves in response to a supplied electromagnetic wave, and to synthesize a single electromagnetic wave from *n* supplied electromagnetic waves is disclosed in accordance with the teachings of the present invention wherein *n* conducting channels comprised of *n* spaced conducting means are disposed intermediate *n* pairs of ports, *n* being an integer greater than two. Said *n* spaced conducting means are further disposed in intersecting relationship with *m* spaced conducting means, where *m* is an integer greater than one, to form discrete junctions at the intersecting points thereof. Each of said *n* and *m* conducting means include portions interposed between adjacent discrete junctions such that said portions have effective lengths equal to integral multiples of a quarter of the wavelength of a supplied electromagnetic wave.

3,678,416

DYNAMIC NOISE FILTER HAVING MEANS FOR VARYING CUTOFF POINT

Richard S. Burwen, 12 Holmes Road, Lexington, Mass.

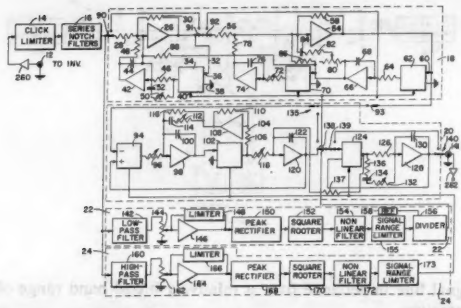
Filed Nov. 3, 1970, Ser. No. 86,398

Int. Cl. H03h *7/10;* **H04b** *15/00*

U.S. Cl. 333—17 **24 Claims**

A dynamic noise filter especially adapted for use in high fidelity audio reproduction systems to eliminate perceived noise. Controllable high-pass and low-pass filters are employed which respectively filter the low and high frequency portions of the audio spectrum. A very wide dynamic range of controllable cutoff points is achieved by each filter with different selectable rates of attenuation with frequency. The same attenuation characteristics are maintained throughout the range of cutoff points for each filter. In the presence of masking audio signals a fast attack, slow decay control is

developed for each filter to cause the amount of filtering to decrease with increasing masking signals. The novel noise



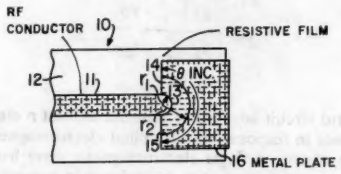
filter further features high frequency click impulse reduction, hum noise attenuation, and corner peaking and attenuation rate control.

3,678,417

PLANAR R. F. LOAD RESISTOR FOR MICROSTRIP OR STRIPLINE

Lawrence H. Ragan, Dallas, and Charles R. Pratt, Richardson, Tex., assignors to Collins Radio Company, Dallas, Tex.

Filed July 14, 1971, Ser. No. 162,515
Int. Cl. H01p 1/26
U.S. Cl. 333—22 R **10 Claims**



A planar film RF load resistor useful, in some instances, from dc up into the microwave frequency range and, in other instances, particularly useful through broadband ranges in the microwave frequency spectrum range. It is a planar thin (or thick) film RF load resistor having a smaller radius edge in conductive contact with a like shaped radius edge of an RF signal thin (or thick) film conductor, and a larger radius outer edge in conductive contact with a highly conductive film plate. The radius centers are substantially the same for the planar film RF load resistors with both microstrip and stripline units.

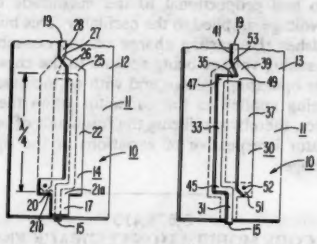
3,678,418

PRINTED CIRCUIT BALUN

Oakley McDonald Woodward, Princeton, N.J., assignor to RCA Corporation

Filed July 28, 1971, Ser. No. 166,771
Int. Cl. H03h 7/38, 7/42; H01p 3/02
U.S. Cl. 333—26 **6 Claims**

A printed circuit balun includes a first relatively broad conductor on a first surface of a dielectric substrate which conductor first-mentioned from an unbalanced end of the balun to a point near the opposite balanced end of the balun. On the opposite or second surface of the substrate, there is provided a second conductor that has a first relatively narrow conductor portion spaced directly opposite the first-mentioned broad conductor. The second conductor also has on the second surface a second relatively broad conductor portion parallel to the narrow portion of the second conductor. The second relatively broad conductor portion of the second conductor is coupled at a point near the unbalanced end of the balun



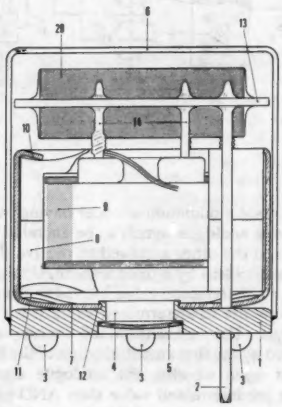
through the substrate to the first-mentiondd broad conductor on the first surface of the substrate. The narrow conductor portion of the second conductor is joined to the broad conductor portion of the second conductor near the balanced end of the balun.

3,678,419

THREE-TERMINAL MODULAR ELECTRIC FILTERS

Jacques R. Boulin, Paris, and Alexis Nepomiastchy, Bagneux, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Dec. 28, 1970, Ser. No. 101,691
Claims priority, application France, Aug. 4, 1970, 7028785
Int. Cl. H03h 7/10; H05k 1/18
U.S. Cl. 333—70 S **2 Claims**



An improved modular construction of a three-terminal electric filter element comprising an adjustable inductance and a plurality of fixed capacitors, comprising an insulating base bearing output pins and assembled to a metal casing, wherein the capacitors are fixed mechanically and connected electrically to a connecting plate which is made of an insulating material and at least one of whose surfaces bears a circuit of electric connections in the form of a printed circuit for connecting the members making up the modular element, and wherein the pins extend through the inside of the casing to engage in holes with which the connecting plate is formed at selected points of the printed circuit.

ERRATUM

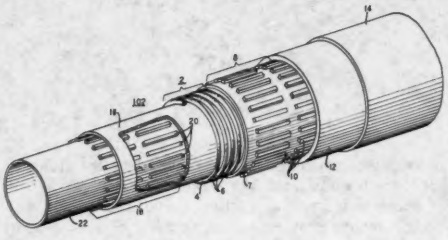
For Class 333—73 see:
Patent No. 3,678,433

3,678,420

SPURIOUS MODE SUPPRESSING WAVEGUIDE

Dietrich Anselm Alsberg, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 27, 1970, Ser. No. 84,436
Int. Cl. H01p *1/16, 3/12*
U.S. Cl. 333—95 R 9 Claims



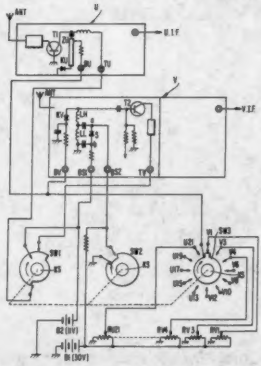
Conversion of the TE_{01} energy mode of electromagnetic wave transmission into spurious or unwanted modes can be reduced by utilizing a dipole array which is interposed in a dielectric lining layer located between the inner wall surface of a conductive waveguide tube and a coupling screen concentric with the tube. A further reduction in mode conversion can be achieved by applying a second dielectric lining containing a dipole pattern around the inside of the coupling screen.

3,678,421

PRESET DEVICE FOR ALL CHANNEL TUNER USING VARIABLE REACTANCE ELEMENT AS TUNING ELEMENT

Ichiro Ono, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1970, Ser. No. 78,518
Claims priority, application Japan, Oct. 6, 1969, 44/95246
Int. Cl. H03j *3/18*
U.S. Cl. 334—15 5 Claims



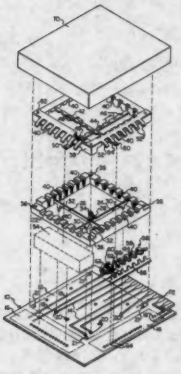
This invention relates to an all channel tuner with means for tuning a variable capacitance element, said means interlocking with an operating shaft of a power source changeover switch. The power source changeover switch changes the polarity of a switching element for short-circuiting part of a coil for the tuning of a VHF tuner. A variable resistor selection switch adjusts a reverse bias to the variable capacitance element. The selection of a desired frequency band and the selection of the variable resistors for a desired channel are simultaneously carried out by the rotation of a channel shaft. A variable reactance element is used as the tuning element. A driver engages the shaft of one of the variable resistors by the pressure in the axial direction of the adjusting shaft. The adjusting shaft is coaxial with the channel shaft.

3,678,422

MINIATURE CROSSBAR SWITCH

William A. Reimer, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed July 29, 1971, Ser. No. 167,314
Int. Cl. H01h *67/14*
U.S. Cl. 335—112 11 Claims



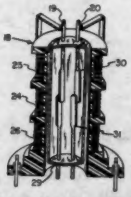
A miniature crossbar switch adapted to be mounted on and connected through a printed wiring card includes a plurality of orthogonal bus bars; those in a first direction being provided with a fixed electrical contact and those in the orthogonal direction being provided with a movable safety pin type contact element. A like plurality of orthogonally disposed select bars having notches adapted to receive the movable contact element are driven by solenoids in axial translation to urge the movable and fixed electrical contacts together to complete a selected circuit path.

3,678,423

WINDINGS FOR OPERATING EFFICIENTLY CONTACTS OF REEDS WITH CONSTRICTED AREAS

Richard M. Rovnyak, Hanover Park, Ill., assignor to Automatic Electric Laboratories, Inc., Northlake, Ill.

Filed Aug. 31, 1970, Ser. No. 68,288
Int. Cl. H01h *51/28*
U.S. Cl. 335—154 1 Claim



The length of an operating winding is related to the positions of constricted areas that result incidentally from forma-

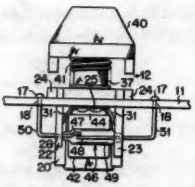
tions of a blade from round wire at one end of each reed. Since sensitivity of a winding for operating the reeds is found to decrease rapidly as the winding becomes longer than the distance between the constricted areas, a sectional winding for operating the reeds is centered over the contacts between the constricted areas, and hold windings, effective after the reluctance of the path has been decreased by closure of the contacts, are positioned in an adjacent winding space.

3,678,424

KEYBOARD SWITCH ASSEMBLY

Hideo Iwashima, and Satoshi Fukao, both of Aichi-ken, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya-shi, Japan

Filed May 13, 1971, Ser. No. 143,092
Claims priority, application Japan, May 19, 1970, 45/42766
Int. Cl. H01h *13/00*
U.S. Cl. 335—206 **9 Claims**



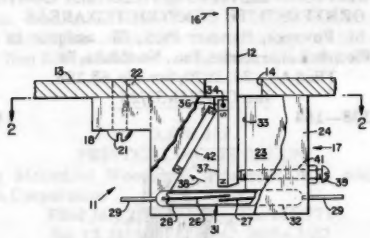
A keyboard switch assembly comprising a flat board printed with key input circuits and perforated with a plurality of apertures; and a plurality of key switch units inserted into the apertures, the unit consisting of a key guide member of synthetic resinous material, a key longitudinally slidable therethrough and a magnetic reed switch connected to the key input circuit so as to be actuated upon key depression.

3,678,425

SELF-CONTAINED REED SWITCH UNIT

Lawrence Holmes, Jr., 22A Byrne Court, Wayne, N.J.

Continuation of Ser. No. 833,126, June 13, 1969, abandoned. This application Dec. 10, 1970, Ser. No. 97,044
Int. Cl. H01h *5/02, 3/16*
U.S. Cl. 335—207 **1 Claim**



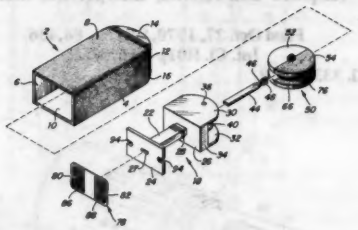
A compact and long lived electrical switch has a housing containing reed contacts of ferromagnetic material which are opened and closed by movement of a permanent magnet carried on a pivotable actuator lever. A stationary second magnet within the housing repels the first magnet to generate a force urging the actuator lever towards the unoperated position thereof.

3,678,426

ELECTROMAGNETIC INDICATOR

George E. Pihl, Abington, Mass., assignor to Miniature Electronic Components Corp., Holbrook, Mass.

Filed Aug. 27, 1971, Ser. No. 175,652
Int. Cl. H01f *7/08*
U.S. Cl. 335—234 **12 Claims**



A two position indicating device including an indicator member in the form of a rotor that carries a single permanent magnet and is mounted for rotation between two limit positions which are determined by engagement of spaced-apart portions of the rotor with the end of a pole piece of a stationary electromagnet structure. The electromagnet structure comprises a combined bobbin and rotor support, the rotor support having two spaced ears and the rotor being rotatably mounted to the spaced ears by detent means comprising a hole in each ear and two pins carried by the rotor. Attachment and removal of the rotor is achieved by flexing the two ears apart far enough to release the two rotor pins. A coil is wound around the bobbin and terminal means are provided for energizing the coil to selectively establish first and second electromagnetic fields of opposite orientation for effecting movement of the rotor between its two limit positions.

ERRATUM

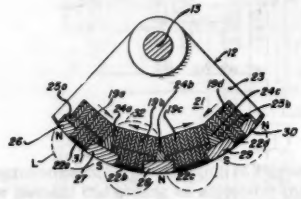
For Class 335—284 see:
Patent No. 3,678,436

3,678,427

MAGNETIC SEPARATOR

Donald G. Morgan, Milwaukee, Wis., assignor to Electronic Memories & Magnetics Corporation, Los Angeles, Calif.

Filed June 10, 1970, Ser. No. 45,095
Int. Cl. H01h *7/02*
U.S. Cl. 335—304 **8 Claims**



A magnet assembly for use such as in a magnetic separator having means for providing increased lines of flux, increased effective pole area, decreased gap length, improved repelling of flux leak lines at the edges of the magnet poles and reduction in the flux leakage at the rear face of the magnet. Herein these means comprise a magnet element disposed at the extremities of the respective poles to define aiding poles in the magnetic circuit.

3,678,428

INTERWINDING SHIELD FOR POWER TRANSFORMERS

Louis Morris, Campbell, Ohio, and Theodore R. Specht, Sharon, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 17, 1971, Ser. No. 143,773
Int. Cl. H01f 15/04
U.S. Cl. 336—84 6 Claims

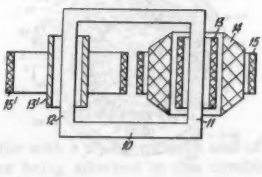
An electrostatic shield for placement between the high and low voltage windings of a power transformer. The shield is constructed from interleaved layers of insulating and conducting strips which are assembled onto an insulating member and placed around the low voltage winding of the power transformer. The shield may be connected to ground potential by means of a header lead which is connected to each conducting strip. The unique construction of the shield provides adequate isolation between the windings without excessive heat development in the conducting strips.

3,678,429

H.V. TESTING TRANSFORMER WINDING ARRANGEMENT

Frank Anthony James Collin, Oldham, England, assignor to Ferranti, Limited, Hollinwood, Lancashire, England

Filed Jan. 8, 1971, Ser. No. 104,953
Claims priority, application Great Britain, Jan. 8, 1970, 901/70
Int. Cl. H01f 27/28
U.S. Cl. 336—170 3 Claims



A high-voltage transformer for producing test voltages has a low-voltage primary winding, a high-voltage secondary winding, and a cascade winding. The primary winding is formed by two separate low-voltage windings wound on separate limbs of a ferromagnetic core and connected in parallel so that their magnetic fluxes assist in the wound core limbs. The high-voltage secondary winding is wound over one only of the low-voltage windings. The cascade winding is formed by two separate low-voltage windings connected in parallel and in phase, one being wound over the high-voltage winding on one limb and the other being wound over the low-voltage winding on the other limb.

3,678,430

PROTECTOR FOR ELECTRIC CIRCUIT

Aldino J. Gaia, St. Louis, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed July 19, 1971, Ser. No. 163,884
Int. Cl. H01h 85/10, 85/30
U.S. Cl. 337—159 18 Claims

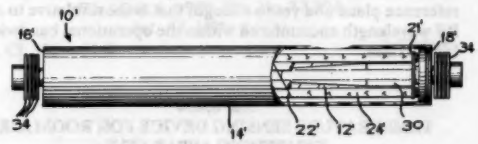
A small diameter, elongated, electric fuse has a casing which encloses and protects a fusible element, an indicating plunger, and a strain wire which normally holds that plunger in retracted position. The fusible element has a portion which is positioned adjacent the inner surface of the casing to permit unobstructed movement of the plunger, has a second portion which is spaced inwardly of the inner surface of the casing so it is largely unaffected by the temperature of the casing, and has a third portion which extends transversely of the casing and which develops a heat barrier and which has an opening to accomodate the strain wire.

3,678,431

HIGH POWER FUSE

LeRoy H. Franklin, 1016 Castlegate Lane, Mountain View, Calif.

Filed Sept. 17, 1969, Ser. No. 858,741
Int. Cl. H01h 85/02
U.S. Cl. 337—185 6 Claims



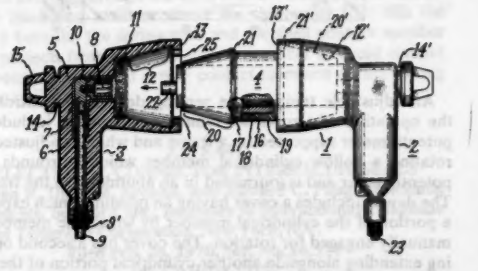
A high power fuse consisting of a helically wound fusible element forming an interior space within with heat withdrawing means can be operated.

3,678,432

VENTED FUSE MODULE FOR UNDERGROUND POWER CABLE SYSTEM

Vincent J. Bolliver, Pittsfield, Mass., assignor to General Electric Company

Filed April 26, 1971, Ser. No. 137,441
Int. Cl. H01h 85/02, 85/54; H01r 13/52
U.S. Cl. 337—201 6 Claims



A multi-part, separable fuse module having a relatively flexible pair of overlapping surfaces that afford a water-tight seal

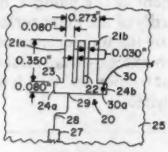
between the parts of the module is provided with gas-venting passage-ways through predetermined portions of these overlapping surfaces in order to enable high pressure gases to temporarily open the passageways and escape from the interior of the module, without allowing water to enter the module. In combination with the fuse module, the invention comprises a rigid clamping member mounted over the relatively separable parts of the module to maintain them in fixed relationship during a gas-venting operation.

3,678,433

RF REJECTION FILTER

Ben R. Hallford, Dallas, Tex., assignor to Collins Radio Company, Dallas, Tex.

Filed July 24, 1970, Ser. No. 58,016
Int. Cl. H03h 7/08
U.S. Cl. 333—73 S **10 Claims**



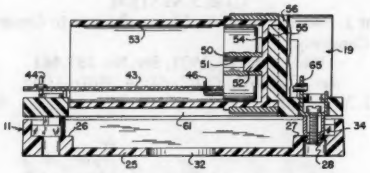
An RF suppression filter using several quarter RF wavelength long strips in parallel that are open-ended to form an RF ground at their common tie-points in the form of a section of conductive line. This base line is extended to terminations at each end to a length beyond the respective outside stubs that enables all stubs to recognize the same electrical reference plane and yet to a length that is short relative to any RF wavelength encountered within the operational bandwidth for the filter.

3,678,434

TEMPERATURE SENSING DEVICE FOR ROOM AIR TEMPERING APPARATUS

Robert E. Brooks, Worthington, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed July 22, 1970, Ser. No. 57,104
Int. Cl. H01c 1/02
U.S. Cl. 338—196 **1 Claim**



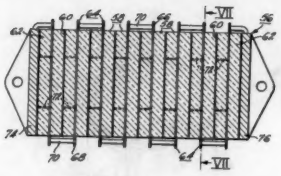
An adjustable temperature sensing device for controlling the operation of a room air tempering apparatus includes a potentiometer supported on a frame and which is adjusted by rotating a hollow cylindrical member which surrounds the potentiometer and is journalled in an abutment on the frame. The device includes a cover having an opening which exposes a portion of the cylindrical member by which the member is manually engaged for rotation. The cover has a second opening extending alongside another cylindrical portion of the adjusting member which exposes a small segment of a spiral indicator on the exterior of the adjusting member for indicating the setting of the potentiometer.

3,678,435

ELECTRICAL RESISTOR

Herbert M. Pflanz, Westwood, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 9, 1970, Ser. No. 87,925
Int. Cl. H01c 1/02
U.S. Cl. 338—263 **18 Claims**



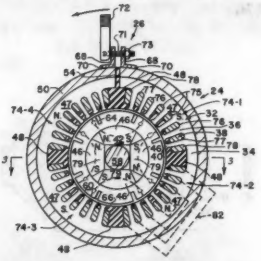
There are disclosed several embodiments of a resistor which comprises an electrical resistance element made of porous resistance material which is completely or partially embedded in a body of inelastic noncombustible electrical insulating material. In one embodiment, the resistance element in the form of a spirally wound ribbon is embedded in a body in the form of a hollow cylindrical insulator in which circuit breaker contacts are housed to provide a built-in resistor in circuit with the contacts. In another embodiment, the resistance element in spirally wound ribbon form is embedded in a body in the form of solid cylindrical insulator to provide a separate resistor. An electrical device, such as a static or solid state component, can be embedded in the solid body in circuit with the resistance element. In another embodiment, the resistance element in the form of a flat sinuous member is embedded in a body of insulating material in the form of a short solid cylindrical member which may be used independently as a resistor or stacked together with other similar units to provide a larger resistor.

3,678,436

MAGNETIZING APPARATUS AND METHOD

William M. Herdrich, and Norman A. Bender, both of Fort Wayne, Ind., assignors to General Electric Company

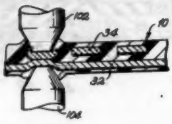
Filed May 24, 1971, Ser. No. 146,133
Int. Cl. H01f 13/00
U.S. Cl. 335—284 **14 Claims**



Apparatus and method for magnetizing a permanent magnet rotor member for a dynamoelectric machine, the rotor member including four members formed of permanent magnet material each having transversely spaced surface areas to be oppositely polarized. A magnetic stator core member is provided having a yoke portion with a plurality of radially inwardly extending teeth defining winding slots therebetween, the teeth being divided into four circumferentially spaced groups and having inner ends defining a bore for receiving the rotor member. Four windings are provided each comprising a plurality of concentric coils distributed in respective ones of the slots of one of the groups of teeth. The windings are con-

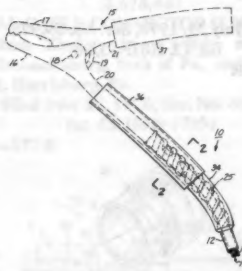
nected in parallel and arranged when energized to excite alternate tooth groups to form opposite poles respectively aligned with the areas to be polarized. A capacitor discharge power supply is coupled to the windings for producing thereacross a momentary high voltage pulse of preselected magnitude thereby to cause a highly peaked surge of current flow in the windings. The preferred method includes establishing a short duration highly peaked magnetic field in preselected regions of space and magnetizing permanently magnetizable members previously disposed in those regions.

3,678,437
FLAT CABLE WAFER
James L. Vaden, Tustin, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Dec. 30, 1970, Ser. No. 102,717
Int. Cl. H01r *29/00*
U.S. Cl. 339—18 C **4 Claims**



A flat cable wafer for interconnection between a first plurality of conductors imbedded in the wafer in a first plane and a second pair of conductors imbedded in the wafer in a second plane. Each of the first plurality of conductors is positioned so as to be interconnectible with each of the second plurality of conductors, the wafer being formed of an insulating material which, upon application of heat transverse to the plane of the wafer causes at least one of said conductors in each of the plurality of planes to be joined together.

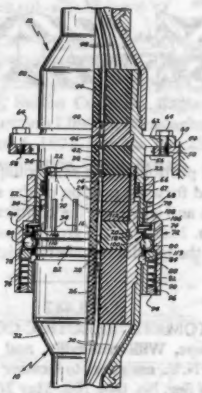
3,678,438
JUMPER CABLE
Michael J. Gamson, 5449 Rimhurst, Glendora, Calif.
Filed March 25, 1971, Ser. No. 128,032
Int. Cl. H01r *11/24*
U.S. Cl. 339—29 B **11 Claims**



A jumper cable with a clamp on each end of an insulated conductor, there being attached to this combination at the junction of the conductor and each of the clamps a peripheral helical flexure to relieve the strain on the junction by limiting the least radius attainable by bending the electrical connector adjacent to the junction.

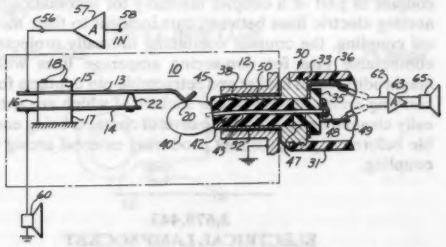
3,678,439
QUICK-RELEASE ELECTRICAL CONNECTOR
Ottomar H. Vetter, Minneapolis, Minn., assignor to United-Carr, Incorporated, Boston, Mass.
Filed Aug. 6, 1970, Ser. No. 61,763
Int. Cl. H01r *13/62*
U.S. Cl. 339—46 **12 Claims**

Twisting a coupling ring in the usual manner causes mating of the two components of an electrical connector. Normally, several balls, more specifically segments thereof, are confined in a circumferential groove formed on one of the components by the encircling coupling ring. When a sufficient axial force is applied, a carrier sleeve causes the balls to be displaced from



the circumferential groove, the carrier sleeve overcoming the biasing action of a coil spring. The dislodgment of the balls is assured by means of a camming sleeve which also assists in returning the balls to the groove for remating the connector.

3,678,440
YIELDABLE ELECTRICAL PLUG
Richard C. Gilsdorf, Duarte, Calif., assignor to Bell & Howell Company, Chicago, Ill.
Filed Oct. 5, 1970, Ser. No. 77,994
Int. Cl. H01r *13/08*
U.S. Cl. 339—61 R **2 Claims**

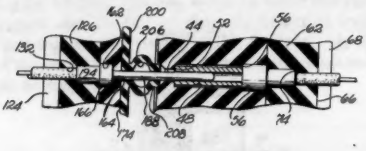


An electrical plug has a hollow-cylindrical shell contact member and a center contact member carried by a spring wire which extends through the shell contact member. An electrically insulating resilient sleeve for the spring wire fills the space between the spring wire and the shell contact member and projects from the shell contact member to avoid contact between the shell and center contact members during flexing of the spring wire.

3,678,441
ELECTRICAL CONNECTOR INTERFACIAL SEALS
Harlan R. Upstone, Arcadia, and Edward C. Paugh, Hacienda Heights, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Feb. 26, 1970, Ser. No. 14,379
Int. Cl. H01r *13/52*
U.S. Cl. 339—94 R **6 Claims**

An interfacial seal for an electrical connector for use between electrical connector interfaces. The environmental

seal is formed of a resilient material and mounted on one of the connectors. A rear portion of the seal is fixed to the connector member. Upon mating, the front portion of the seal forms a sealing surface between the connector members and



an intermediate portion of the seal collapses outwardly. The intermediate and forward portion of the seal may be initially tubular in shape and surround the contacts of one of the connector members. Moreover, a groove may be formed on the inner surface of the tubular members which provides a relief.

3,678,442

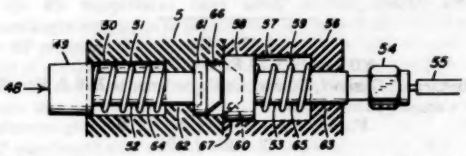
AUTOMATIC ELECTRIC COUPLER

Geoffrey W. Cope, Williamsonville, and George C. Skinner, Elma, both of N.Y., assignors to Dresser Industries, Inc.

Continuation of Ser. No. 844,700, May 26, 1969, abandoned, which is a division of Ser. No. 703,375, Feb. 6, 1968, Pat. No. 3,506,139. This application April 15, 1971, Ser. No. 134,489

Int. Cl. H01r *13/52, 13/24*

U.S. Cl. 339—111 **1 Claim**



An electric coupler mountable on a mechanical railway coupler as part of a coupler assembly for automatically connecting electric lines between cars incident to their mechanical coupling, the coupler combining normally projected end contactable pins for non-arcing amperage lines with hermaphroditic fixed socket and retractable pin contacts for lines carrying arcing amerages, the sockets of which are automatically cleaned on coupling, the several contacts being energizable before coupling without producing external arcing during coupling.

3,678,443

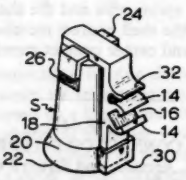
ELECTRICAL LAMP SOCKET

Rudolph Koehler, 32 Fleming Drive, Willowdale, Ontario, Canada

Filed May 19, 1969, Ser. No. 825,821

Int. Cl. H01r *13/60*

U.S. Cl. 339—119 L **10 Claims**



A form lighting assembly and lamp sockets therefor wherein each socket has a heavy duty resilient clip stiff enough to maintain the socket in a fixed orientation on the form. The clip may either be integral with the exterior side wall of the socket or may be carried on a separate tongue itself firmly anchored to the socket.

3,678,444

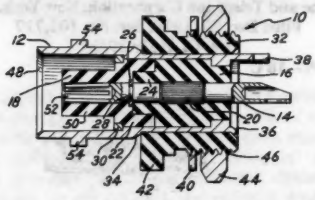
CONNECTOR WITH ISOLATED GROUND

William P. Stevens; George M. Hubbard, and William D. Wagner, all of Franklin, Ind., assignors to The Bendix Corporation

Filed Jan. 15, 1971, Ser. No. 106,838

Int. Cl. H01r *17/04;* H02b *1/02*

U.S. Cl. 339—130 C **5 Claims**



A chassis mountable coaxial cable connector assembly having an isolated ground. A connector pin is attached to the center wire of the coaxial cable with insulation surrounding the connector pin to prevent unwanted signal attenuation to a housing of the connector assembly. The housing is connected to the shielding braid of the coaxial cable with the shielding braid and housing forming a floating type ground. The cable connector assembly includes a unitary constructed flanged cylinder with a threaded portion for mounting the connector assembly in a chassis and, simultaneously, isolating the housing from the chassis.

3,678,445

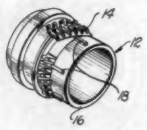
ELECTRICAL CONNECTOR SHIELD

Salvatore T. Brancaleone, Temple City, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 31, 1970, Ser. No. 59,978

Int. Cl. H01r *15/06*

U.S. Cl. 339—143 R **2 Claims**



A shielding arrangement for eliminating electromagnetic interference in an electrical connector. A first shell member contains a bore portion on its outer surface and an annular groove adjacent to the bore portion. A conductive shielding member having a section contiguous to the bore portion and a first spring portion adjacent one side of the surface snaps into the groove for removably securing the shield to the shell and a second spring portion adjacent the other side of the section. The second spring portion may be formed at an acute angle with respect to the section and yieldable to provide good electrical contact between the first shell member and a second shell member movable with respect to said first shell member. The first shell member may contain a second annular groove opposite the first annular groove, the shield section at junction

of the section and the second spring member being insertable into the second annular groove. Further, the spring members may be formed of finger portions.

3,678,446

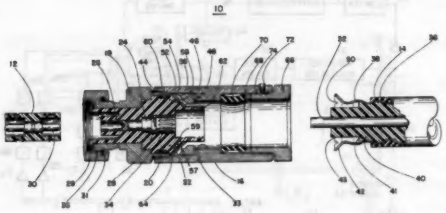
COAXIAL CABLE CONNECTOR

Hilbert R. Siebelist, Las Vegas, Nev., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed June 2, 1970, Ser. No. 42,636

Int. Cl. H01r *17/04*

U.S. Cl. 339—177 E **5 Claims**



A connector for coaxial cables suitable for use on a group of cables having the same impedance characteristics and similar nominal size but different structural details. A backshell of the connector which is sufficiently large to receive each cable of the group fastens to a body which contains a mass of dielectric material in which a central conductor contact is fitted. A seat and collar with complementary frustoconical surfaces adapted to receive an outwardly and forwardly flared end of the outer conductor of the cable are positioned generally within the transition between the backshell and the body. Complementary fastening means on a body and the backshell force the collar and seat together against the flared end of the outer conductor.

3,678,447

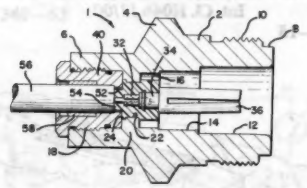
COAXIAL CABLE CONNECTOR SUB-ASSEMBLY

George William Ziegler, Jr., Carlisle, and Donald Kent Hughes, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 17, 1970, Ser. No. 46,942

Int. Cl. H01r *17/04*

U.S. Cl. 339—177 E **6 Claims**



The invention relatives to male and female coaxial cable connector sub-assemblies utilizing a universal fitting crimped to the end of a coaxial cable and threadably attached to a sub-assembly. Each sub-assembly has a central dielectric plug press-fitted in place. A center contact or a center contact receptacle is pressed into the plug and maintained by a protecting skirt which bites into the dielectric plug. The center contact or receptacle receives a projecting portion of the coaxial cable center conductor when the universal fitting is threadably attached. In other preferred embodiments, the center contact and the corresponding center contact receptacle are each laterally supported by another dielectric plug which provides adjustment for impedance mismatch entirely through the connector sub-assembly.

3,678,448

PINS FOR ELECTRICAL CONNECTORS

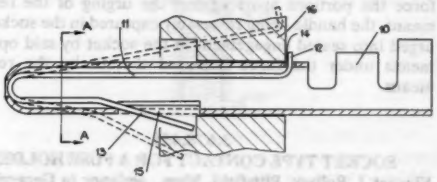
Donald Allan Young, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Jan. 6, 1971, Ser. No. 104,235

Claims priority, application Great Britain, Jan. 10, 1970, 1,321/70

Int. Cl. A01r *9/08*

U.S. Cl. 339—217 S **1 Claim**



A pin for an electrical connector is of hollow form and contains a leaf spring whose ends project from the pin at axially spaced locations to locate the pin axially in an associated connector body. One of the spring ends can be depressed to allow the pin to enter the body.

3,678,449

BATTERY TERMINAL CLAMP

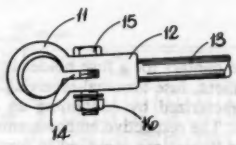
Richard Clive Jones, Bromsgrove, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 10, 1970, Ser. No. 88,366

Claims priority, application Great Britain, Nov. 21, 1969, 57,037/69

Int. Cl. H01r *11/26*

U.S. Cl. 339—225 **3 Claims**



A battery terminal clamp comprises a conductive collar adapted to engage a terminal post, and an integral sleeve extending from said collar and adapted to have a lead electrically connected thereto. A slot is formed in the sleeve and the clamp further includes locking means for reducing the diameter of the collar by closing the slot, so that in use on a battery the collar grips and makes electrical connection to a terminal post of the battery.

3,678,450

BATTERY CONNECTOR

Eugene C. Azamber, 4664 W. Hammond, Fresno, Calif., and Frank D. Cabe, 1310 N. Wishun Avenue, Fresno, Calif.

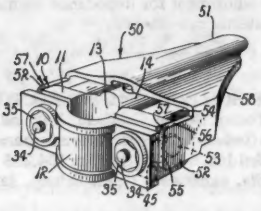
Filed March 31, 1971, Ser. No. 129,925

Int. Cl. H01r *13/62*

U.S. Cl. 339—226 **8 Claims**

A battery connector having a body providing separable portions defining a clamping opening therebetween, resilient

means urging the portions toward each into clamping configuration, one of said portions having a socket therein disposed toward an opposite portion, and a handle pivotally mounted in the socket engageable with the opposite portion operable to



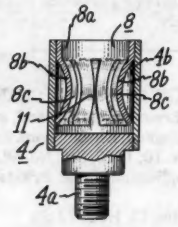
force the portions apart against the urging of the resilient means, the handle being releasably captured in the socket and urged into seated engagement in the socket by said opposite means under the force imparted thereto by the resilient means.

3,678,451

SOCKET TYPE CONTACT FOR A FUSE HOLDER

Vincent J. Bollver, Pittsfield, Mass., assignor to General Electric Company

Filed Dec. 7, 1970, Ser. No. 95,660
Int. Cl. H01r *13/12*
U.S. Cl. 339—258 R **7 Claims**



A socket type contact for a fuse holder is provided with a plurality of resilient, fuse-terminal-receiving fingers, each of which are characterized by containing an embossment or knurled portion. The respective embossments on each of the resilient contact fingers are arranged to form a substantially linear contact surface for a fuse terminal that is adapted to be inserted between the contact fingers. The contact configuration thus defined affords a high pressure, line contact between the flexible fingers and a fuse terminal while at the same time enabling the terminal to be pivoted axially about the line contact without causing the fingers to move radially with respect to the contact body.

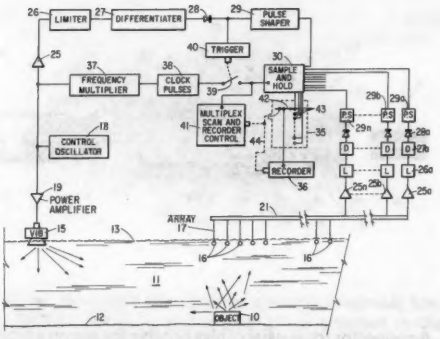
3,678,452

RECORDING ELASTIC-WAVE PHASE HOLOGRAPHIC DATA

Daniel Silverman, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Continuation-in-part of Ser. Nos. 824,925, May 15, 1969, and Ser. No. 858,635, Sept. 17, 1969. This application April 30, 1970, Ser. No. 33,417
Int. Cl. G01s *9/66*
U.S. Cl. 340—3 R **11 Claims**

In elastic-wave holography where transducers are used to convert the detected elastic waves into corresponding electrical signals, the phase pattern of many transducers spread over the hologram area is recorded by sampling all of the electrical signals during one cycle of the coherent elastic waves to get a relative time delay for the zero-axis crossings of each signal. Pulses at zero-axis crossing times, produced by amplifying, clipping, and differentiating the signals, are then shaped or stretched to form short square waves of time duration M, or phase duration K electrical degrees, where K equals 360°/L, L being the integral number of phase intervals into which the coherent-wave cycle is subdivided. Each value of K also corresponds to one step of the gray scale used in recording the final hologram.



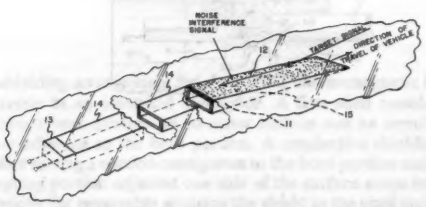
To record the hologram directly or in a form suitable for later playback, all transducer outputs during one coherent-wave cycle are scanned L times, once for each successive K° interval, to detect the square-wave pulses. In each scan, the occurrence times of pulses correspond to those transducer positions in the hologram area having relative phases within the given K° interval. These are accordingly the positions for recording a particular gray-scale density on the final hologram. Succeeding scans detect the positions of different phase and different corresponding density on the hologram, until all phase intervals and hologram density points have been covered.

3,678,453

FLUSH MOUNTED ACOUSTIC SENSOR

Tibor G. Horwath, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army

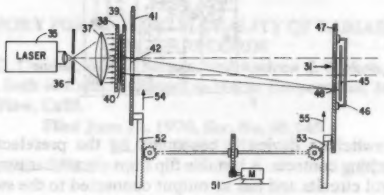
Filed Oct. 23, 1970, Ser. No. 83,561
Int. Cl. H04b *11/00*
U.S. Cl. 340—15 **3 Claims**



This invention is a dynamic pressure sensor of the flush mounted variety for use in sensing the presence of an acoustic energy source in a moving fluid environment. The sensor is especially adaptable to moving vehicle applications wherein the sensor is located on the moving vehicle and boundary

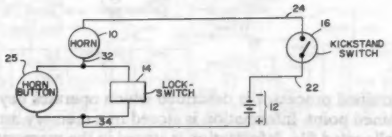
layer interference due to movement of the vehicle and the sensor in air is a prime consideration.

3,678,454
GEOPHYSICAL SURVEYING USING FRESNEL PILOT SIGNALS
John B. Farr, and Ralph A. Landrum, Jr., both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.
Filed May 2, 1969, Ser. No. 821,189
Int. Cl. G01v *1/28*
U.S. Cl. 340—15.5 SC **9 Claims**



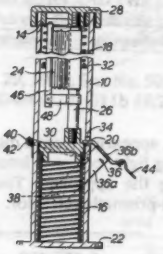
In seismic geophysical surveying, a servo-controlled vibrator is driven by a pilot signal that corresponds generally to the variations in density that are encountered in scanning at a constant rate along a radial segment of a Fresnel zone plate, and the resulting seismic waves that arrive at a spaced receiver are recorded as a conventional variable density trace. The pilot signal is thus one that becomes self-compressing by the diffraction of monochromatic light to a focal point on the axis of the zone plate. Accordingly, illumination of the recorded variable density trace by monochromatic light effectively time-compresses each repetition of the pilot signal in the recorded trace by producing in the plane of the Fresnel zone plate focus a concentration of illumination that represents by its intensity and position the amplitude and travel time of seismic wave energy from the vibrator to the receiver by a particular path. In practice, any pilot signal for which the frequency varies linearly with time is so closely similar to a true Fresnel signal that it focuses monochromatic light in the same way.

3,678,455
CYCLE THEFT ALARM
Richard S. Levey, 2 Foyler Avenue, Lynbrook, N.Y.
Continuation-in-part of Ser. No. 826,164, May 20, 1969, abandoned. This application Jan. 14, 1971, Ser. No. 106,460
Int. Cl. B60r *25/10*
U.S. Cl. 340—63 **3 Claims**



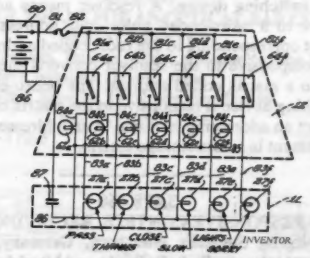
An alarm device wherein the horn button, normally found on motorcycles, is by-passed with a lock switch. A lead of a battery is joined to a kickstand switch and to the horn, so that when the kickstand switch is moved to a closed position with a lock switch closed, the horn sounds. The kickstand switch is spring loaded in an open position so that it closes only when the weight of the motorcycle is removed.

3,678,456
VEHICLE MOUNTED WARNING DEVICE
Eugene Gerald Gruber, 70 Paisley Boulevard, Mississauga, Ontario, Canada
Filed Dec. 7, 1970, Ser. No. 95,811
Int. Cl. B60q *1/00*
U.S. Cl. 340—87 **2 Claims**



Means for supporting a visual warning signal for movement on a vehicle between a retracted, concealed position and an extended display position; a latch releasably holding said signal in the concealed position and a spring biasing it to display position when released by the latch; the movement of the signal to display position being controlled by limiting and speed checking devices.

3,678,457
INDICATOR FOR AUTOMOBILES
Edward R. Lev, 3121 W. Jerome Street, Chicago, Ill.
Filed June 29, 1970, Ser. No. 50,676
Int. Cl. B06q *1/00*
U.S. Cl. 340—107 **2 Claims**

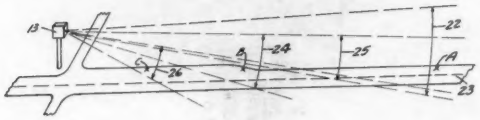


A visual signal indicator for vehicles which has a light unit mountable at the rear of the vehicle which contains a plurality of separate light source containing chambers adapted to reflect light towards one end of the chambers, each chamber being closed at that end by a translucent-opaque screen containing one or more messages illuminated by the light, and a control unit adapted to be attached interiorly of the vehicle, the control unit having switching for selectively activating different chambers of the rear mounted unit, the control unit also including indicator means for indicating which of the rear mounted chambers is illuminated.

3,678,458
DIRECTIONAL SIGNAL HAVING REFRACTIVE INDICANT AREAS

Gunnar R. Ljungkull, White Bear Lake, and Robert H. Johnson, Saint Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 9, 1970, Ser. No. 53,592
Int. Cl. B60q *1/100*
U.S. Cl. 340—107 7 Claims

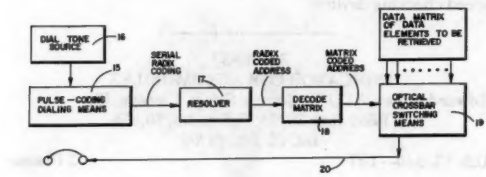


A traffic signal, appearing from a distance as a uniformly illuminated warning light, converts into an instructional signal as viewed during the approach. The instructional area is defined by a multi-prismatic refractor.

3,678,459
OPTICAL CROSSBAR SWITCHING DEVICE

Arthur J. Grolitzer, Reseda, and Francis E. Mounts, Santa Monica, both of Calif., assignors to Rheem Manufacturing Company, New York, N.Y.

Continuation of Ser. No. 762,746, Sept. 26, 1968, abandoned.
This application April 23, 1971, Ser. No. 137,087
Int. Cl. H03k *19/14*
U.S. Cl. 340—166 6 Claims



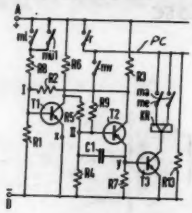
Electronic data matrix retrieval means employing an optical crossbar switching device. A resolver means adapted to be responsive to a radix-coded pulse code address provides an output set corresponding to the radix coded address. A matrix decoder responsive to the resolver converts the radix-coded address to a matrix coded address. The photo-electric crossbar switching device is responsive to the matrix coded address to connect an addressing terminal to an addressed terminal of a data element in a data storage matrix.

3,678,460
CODE-RESPONSIVE CONTROL RECEIVING SYSTEM

Hans-Wolfgang Steinlein, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 29, 1971, Ser. No. 128,682
Claims priority, application Germany, April 2, 1970, P 20 15 674.5
Int. Cl. H04q *9/00*
U.S. Cl. 340—167 5 Claims

A code-responsive control receiving system for response to a preselectable code combination operates on the pulse interval principle and has a polarized command relay with differential windings which have one energizing lead in common. In the receiver system, a pulse circuit is supplied with pulse sequences of active and passive preselection pulses for the preselection of the code combination. A synchronous selector has switching members for selectively connecting the respective windings of the command relay to the pulse circuit. The switching members of the selector comprise preselector contacts proper, main contacts and quenching contacts. A receiver relay is provided with make contacts which close in accordance with the rhythm of the arriving pulses and connect the pulse circuit to a direct voltage source when the make contact closes. The main contacts are connected in the separate leads of the relay windings, and a switching device, preferably a transistor, is connected in the common lead of the windings.

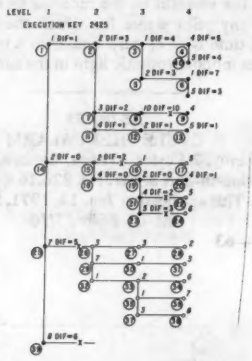


The switching device is controlled by the preselector and quenching contacts. A bistable flip flops circuit has two trigger control circuits and has an output connected to the switching device so as to control the switching operation thereof. One of the control input or trigger circuits is connected through the quenching contact to one pole of the direct voltage source. The other control input circuit of the flip flop circuit is connected through the preselector contacts to the pulse circuit.

3,678,461
EXPANDED SEARCH FOR TREE ALLOCATED PROCESSORS

William C. Choate, Dallas, and Michael K. Masten, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 1, 1970, Ser. No. 42,430
Int. Cl. G06f *15/40*
U.S. Cl. 340—172.5 24 Claims



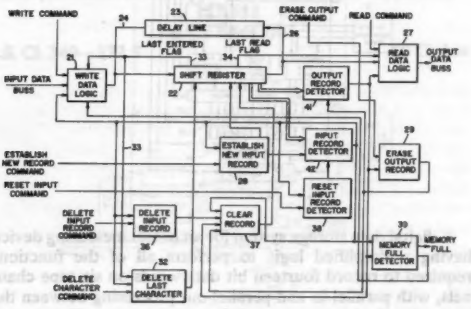
A trained processor is described which operates beyond an untrained point. Information is stored in a memory array in a tree allocated file. Information is stored in the memory as key functions with associated trained responses. After the processor has been trained, it is able during an execution cycle to find and appropriate response for other key functions. These key functions are compared with the reference key functions stored in the memory array to find an appropriate trained response. During the execution cycle, there are some key functions for which there is no corresponding reference key function stored in the memory array and thereupon no appropriate trained response. These key functions for which no

trained response is found are termed untrained points. Thereupon a key function which constitutes an untrained point is effectively compared with the reference key functions stored in the memory array to establish and store a difference function relative to each stored key function. Logic means then selects for the untrained point a trained response from those trained responses best satisfying a predetermined decision criteria. During the comparison operation, conditions are measured that indicate when key functions corresponding to a given group of trained responses cannot be an appropriate response for the untrained point in question. Logic means waive further examination of stored key functions, and thereby greatly expedite the efficiency of search.

3,678,462
MEMORY FOR STORING PLURALITY OF VARIABLE LENGTH RECORDS

David C. Condon, Monte Sereno, and Andrew J. Nichols, Palo Alto, both of Calif., assignors to Novar Corporation, Mountain View, Calif.

Filed June 22, 1970, Ser. No. 48,145
Int. Cl. G06f *13/02*
U.S. Cl. 340—172.5 **10 Claims**

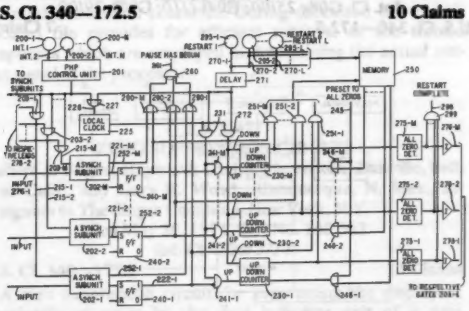


Memory apparatus for use with a data processing system having an electric typewriter input/ouput where the memory unit includes a delay line along with logic means which provide for dynamic allocation of memory space. In particular, this is provided by a particular data format with certain character flags and record markers.

3,678,463
CONTROLLED PAUSE IN DATA PROCESSING APPARTUS

Theodore Richmond Peters, Bernardsville, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed April 27, 1970, Ser. No. 32,083
Int. Cl. G06f *9/18*
U.S. Cl. 340—172.5 **10 Claims**

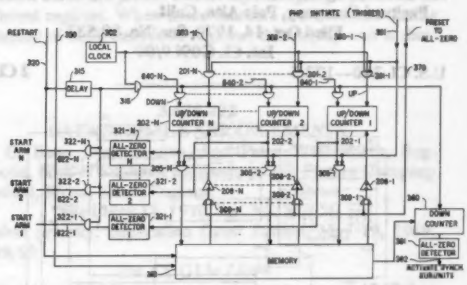


Apparatus for permitting a precise halt and restart in execution in one or more subunits in a data processing system which subunits are not necessarily amenable to an immediate halt. Means are provided to determine and store for each such subunit the respective time, T_E, elapsed from the occurrence of a request to halt until an actual halt is effected (usually at the end of a processing sequence). Upon restarting of the system generally, the particular subunits are delayed by an amount equal to the respective value of T_E.

3,678,464
CONTROLLED PAUSE AND RESTART OF MAGNETIC DISC MEMORIES AND THE LIKE

Theodore Richmond Peters, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 29, 1970, Ser. No. 50,470
Int. Cl. G06f *9/18*; G11b *19/20*
U.S. Cl. 340—172.5 **9 Claims**

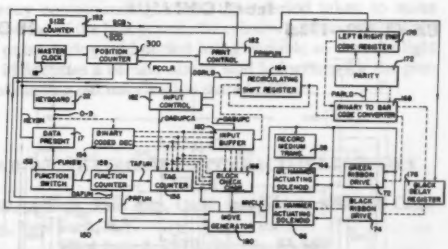


Techniques are disclosed for permitting the halt and subsequent synchronized restart of a data processing or similar system including a plurality of asynchronous subunits such as magnetic disc memories by generating and storing information indicative of the state of each subunit at the time of halting, and, at the time a system restart is desired, by delaying the restart of individual subunits by an appropriate period which is a function of the previously stored information.

3,678,465
CONTROL MEANS FOR AN OPTICAL BAR CODE SERIAL PRINTER

Richard E. Graham, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed June 30, 1970, Ser. No. 51,149
Int. Cl. G05b *11/01*
U.S. Cl. 340—172.5 **27 Claims**



Control logic circuitry for a printing apparatus which records data according to a predetermined color bar code on a moving record medium. The apparatus includes first and second recording stations and a feed mechanism for successively feeding the record medium thereto in equal increments, so as to provide equally-spaced recording locations on the

record medium. First and second indicia (parallel bars printed in first and second colors) are recorded on the record medium at the appropriate recording locations in conformity with the code. The surface of the record medium is used for a third indicium, which likewise is recorded thereon in the form of a parallel bar. Data to be recorded on the record medium is entered through a keyboard and converted by the logic into a bar code which is fed to logic circuitry which controls printing apparatus at the first and second recording stations and the record medium feed mechanism, thereby determining the color printed on the recording medium.

The code used is of the transition type, which utilizes three different indicia. Each succeeding indicium printed on the record medium is always different from the adjacent indicium, thus eliminating the need for a separate clocking pulse on the record medium.

3,678,466

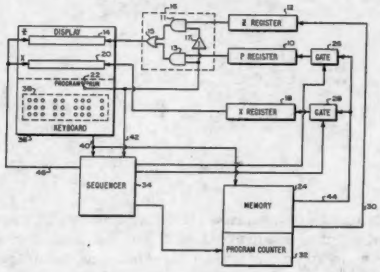
ELECTRONIC CALCULATOR

Richard M. Spangler, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 14, 1970, Ser. No. 80,533

Int. Cl. G09f 9/00

U.S. Cl. 340—172.5 **2 Claims**



A programmable electronic calculator having a display register for storing numerical information is provided with an additional register which always contains the current instruction code and program statement number. A control on the keyboard permits the display of either register without disturbing the contents of either register.

3,678,467

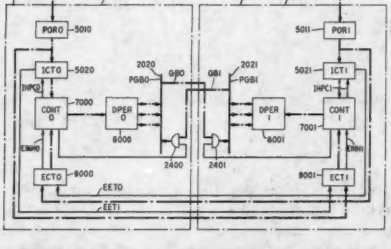
MULTIPROCESSOR WITH COOPERATIVE PROGRAM EXECUTION

Eric Nussbaum, St Charles; Wing Noon Toy, Glen Ellyn, both of Ill., and Melvin Neil Wolnsky, Dover, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 20, 1970, Ser. No. 82,354

Int. Cl. G06f 15/16

U.S. Cl. 340—172.5 **18 Claims**



Disclosed herein is a multiprocessor control for a communications switching system wherein an instruction stored in the program order register of one processor is decoded both within that processor and within another processor to initiate and control cooperative data processing operations in both processors. Data and control information is exchanged between processors by means of cross-coupled gating buses which are employed within each respective processor for communication among its own registers and data processing functional circuits.

3,678,468

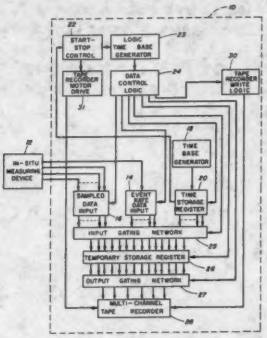
DIGITAL DATA STORAGE SYSTEM

Donald E. Jefferson, Silver Spring, and Ronald G. Vermillion, Rockville, both of Md., assignors to the United States of America as represented by the Secretary of the Navy

Filed Dec. 15, 1970, Ser. No. 98,345

Int. Cl. G01v 3/00; G11b 5/00

U.S. Cl. 340—172.5 **11 Claims**



A digital data storage system for an in-situ measuring device having a simplified logic to perform all of the functions required to record fourteen bit data words on six tape channels, with parallel-in and parallel-out processing between the measuring device sensors and the tape recorder. The storage system accepts and records sampled data and event data from the measuring device and records the time of occurrence of this data. An internal clock and associated logic determine the initiation and termination of sampling intervals, and other logic controls the transfer of data from temporary storage to tape.

3,678,469

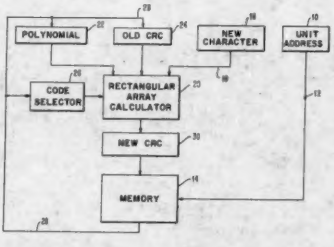
UNIVERSAL CYCLIC DIVISION CIRCUIT

Richard B. Freeman, Cary; Michael T. Kawalec, Chapel Hill; Andrew W. Maholick, and Stanley R. Stager, III, both of Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 1, 1970, Ser. No. 94,070

Int. Cl. G08c 25/00; H04l 1/10; G08b 29/00

U.S. Cl. 340—172.5 **7 Claims**



Described is a universal cyclic division circuit for developing cyclic redundancy checks upon data wherein the circuitry

may be utilized for more than one character size and for more than one polynomial. The system employs a storage device which contains information as to the character size in use as well as storage for the polynomial being used for checking data transmissions over a given communications channel. This information is used to control a universal matrix which uses the stored polynomial to generate the proper cyclic redundancy check character for the new data received and combines it with the cumulative cyclic redundancy check character developed by the matrix for previous characters. Upon the completion of a data transmission, the cyclic redundancy check character developed by the matrix should be identical to the cyclic redundancy check character developed in the transmitter if an error free transmission and reception has occurred.

3,678,470

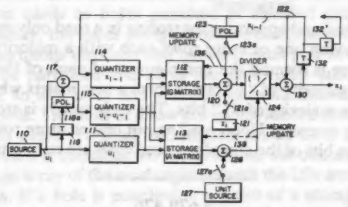
STORAGE MINIMIZED OPTIMUM PROCESSOR

William C. Choate, and Michael K. Masten, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 837,425, June 30, 1969, abandoned, and a continuation of Ser. No. 889,240, Dec. 30, 1969, abandoned. This application March 9, 1971, Ser. No. 122,513

Int. Cl. G06f *3/05*

U.S. Cl. 340—172.5 **10 Claims**



A trainable signal processor having at least one input signal u and one desired output signal z applied thereto during training and having at least one input signal u and one actual output signal x derived therefrom during execution is provided. From each member of the input sequence $u(t_i)$ a key K_i is generated. K_i may have only a finite number of values and is a single valued function of u. Corresponding to a specific value of the K_i generated during training a trained response is derived from samples of the desired output signal z measured at instances t_i at which that value of K_i occurred and is maintained in a tree allocated file. The file thereby associates with each set of K_i values a trained response. Storage is provided for only those sets of K_i values which actually occurred during training, generally constituting a small fraction of those sets which may theoretically occur, particularly when the input is of multidimensional character. During execution the tree allocated file provides for efficient retrieval of the trained responses which are employed in determining the actual output signal of the processor.

3,678,471

ZERO SUPPRESSION CIRCUIT

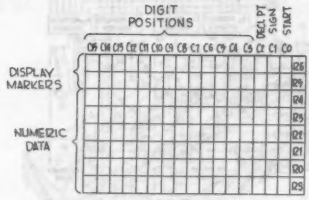
Robert A. Ragen, Hayward; Carl E. Herendeen, Danville, both of Calif., and Gary R. Wood, Albuquerque, N. Mex., assignors to The Singer Company, New York, N.Y.

Filed May 20, 1971, Ser. No. 145,362

Int. Cl. G06f *3/14*

U.S. Cl. 340—172.5 **13 Claims**

A zero suppression circuit for suppressing the display of nonsignificant zeros by the data indicator unit of a data storage system, e.g., the memory unit of an electronic desk top calculator. Each displayed register is individually examined order-by-order; a counter is incremented at the beginning of each examined digit position and is reset to an initial state for each digit position containing a nonzero digit. After each digit position of a register has been examined, zero suppression markers corresponding to the digit positions containing non-



significant zeros are placed in corresponding digit positions of a different register. When these markers are detected during the display of each examined register, the display unit is disabled.

3,678,472

DATA STORAGE ARRANGEMENTS

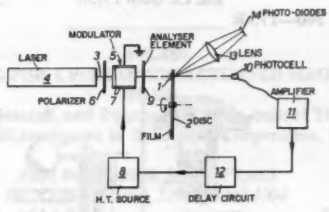
John C. Bass, Northampton, and Peter Waterworth, Bugbrooke, both of England, assignors to The Plessey Company Limited, Ilford, Essex, England

Filed May 13, 1970, Ser. No. 36,734

Claims priority, application Great Britain, May 19, 1969, 25,489/69

Int. Cl. G11c *13/04*

U.S. Cl. 340—173 LT **12 Claims**



A data storage arrangement in which information is stored in the form of a plurality of juxtaposed holograms in which a pulsed light beam is caused to successively traverse the holograms, it being arranged that the light beam pulsates at a frequency corresponding to the time period taken to make one traverse of the holograms, the relative position of the light beam pulse during said period being variable so that the light beam illuminates a certain one of said holograms for the purpose of reading out information stored therein.

3,678,473

READ-WRITE CIRCUIT FOR CAPACITIVE MEMORY ARRAYS

Sven Wahlstrom, Palo Alto, Calif., assignor to Shell Oil Company, New York, N.Y.

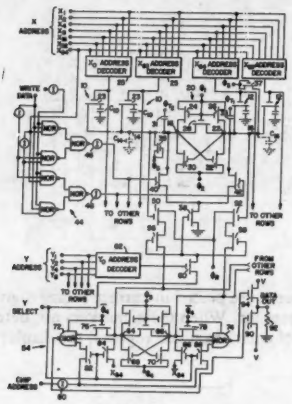
Filed June 4, 1970, Ser. No. 43,460

Int. Cl. G11c *11/24, 11/40*

U.S. Cl. 340—173 CA **15 Claims**

Writing on a memory array equipped with a cross-coupled MOSFET sensing circuit operating on a race principle is facilitated by always writing a "0" but selecting the node of the cross-coupled MOSFET sensing circuit onto which the

"0" is written. A low-impedance data output can be provided by driving data output line gates through a NOR gate output



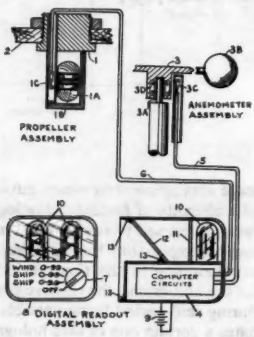
amplifier which also prevents switching transients from interfering with the race.

3,678,474

MARINE SPEEDOMETER AND ANEMOMETER WITH DIGITAL READOUT

Robert M. Brown, Lyndhurst, Ohio, assignor to Robert M. Brown and Computech, Inc., Lyndhurst, Ohio

Filed Sept. 3, 1970, Ser. No. 69,217
Int. Cl. G06f 15/50
U.S. Cl. 340—173 R **7 Claims**



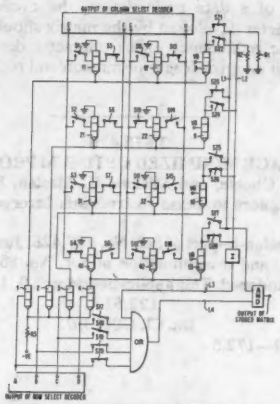
A marine speedometer and anemometer utilizing a common computer circuit and having an electro-luminescent display. A selector switch connects a pulse source and at the same time selects the proper computer circuits to produce a direct digital readout of ship or wind speed in knots or miles per hour. The pulses sources are a propeller device installed beneath the boat in the water and a cup or vane type anemometer rotor device mounted in the open where it can be driven by the wind. The digital display is mounted in a deep enclosure along with the computer circuitry and is fitted with a non-reflecting filter and window for protection against water and weather and to insure good legibility in bright or dark lighting.

3,678,475

READ ONLY MEMORY AND METHOD OF USING SAME

Paul V. Jordan, Beacon; John A. Palmieri, Wappingers Falls, and William T. Wade, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,504
Int. Cl. G11c 11/40, 17/00
U.S. Cl. 340—174 SP **14 Claims**



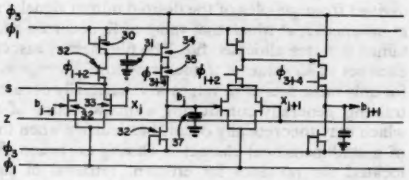
A method and apparatus for storing in a read only memory a matrix having one or more rows each with a majority of "1" bits. There is formed the complement of each of those rows having a majority of "1" bits to form a new matrix wherein no row has a majority of "1" bits. The new matrix is stored in a read only memory. Upon reading out one or more rows of the matrix the bits of the complemented rows are reinverted.

3,678,476

READ-ONLY RANDOM ACCESS SERIAL MEMORY SYSTEMS

Michel A. Ebertin, Yorba Linda, Calif., assignor to North American Rockwell Corporation

Continuation of Ser. No. 783,536, Oct. 13, 1968, abandoned.
This application Jan. 25, 1971, Ser. No. 109,557
Int. Cl. G11c 11/40, 19/00
U.S. Cl. 340—173 SP **1 Claim**



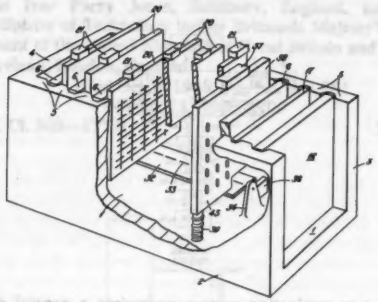
A plurality of words each having a variable word length is stored in a memory by selectively connecting input lines for each of the words to storage elements corresponding to each bit position of each word. Storage elements for certain bit positions are connected to an input line or lines having a voltage level representing a logic "1" and the remaining storage elements are connected to an input line having a voltage level representing a logic "0". A read-only memory system is implemented after the connections are made. The lines are actuated to apply the voltage levels to the storage elements. The stored information is shifted out of the memory system during a readout period following the actuation of the lines. The read-only memory may be randomly addressed by actuating a selected input line prior to gating the information from the memory system.

3,678,477

INFORMATION STORAGE EQUIPMENT

William Sinclair, Bramcote, England, assignor to Ericsson Telephones Limited, Ilford, Essex, England

Filed Sept. 5, 1969, Ser. No. 855,525
Claims priority, application Great Britain, Sept. 25, 1968, 45640
Int. Cl. G11c *17/00*; G06k *7/06*
U.S. Cl. 340—173 R 7 Claims



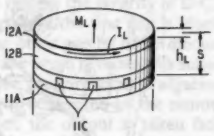
A punched card information store in which information is stored on cards as holes punched at selected points of a storage array, the cards being stored vertically in a container having partitions disposed one between each pair of adjacent cards. The partitions and cards are perforated uniformly at points of an idle array and accommodate horizontal rows of sensing balls. The balls of a row are spring-loaded into contact with each other. To read information stored on a card, the relevant card is displaced vertically within the container until the storage array of the card registers with the idle array of the partitions. If a hole is punched at a point of a storage array, displacement of the card does not affect the balls of the row running horizontally through the point concerned. But if there is no hole, adjacent balls of the row become separated by the thickness of the displaced card. Ball separation is sensed at the springs, affording a sensed pattern that is the inverse of the storage pattern punched on the displaced card.

3,678,478

STACKING ARRANGEMENT WHICH PROVIDES SELF-BIASING FOR SINGLE WALL DOMAIN ORGANIZATIONS

John Alexander Copeland, III, Gillette, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 18, 1971, Ser. No. 116,407
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 TF 8 Claims



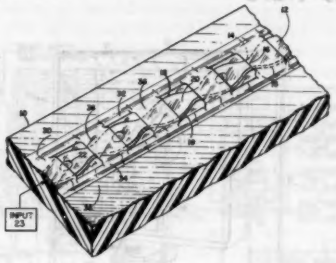
Large capacity memory systems employing single wall domain devices comprise an arrangement in which layers, of materials in which domains can be moved, are stacked to form a compact component. A stacking arrangement is described which eliminates the necessity of an externally supplied bias field normally present, for practical purposes, in single wall domain devices.

3,678,479

CONDUCTOR ARRANGEMENT FOR PROPAGATION IN MAGNETIC BUBBLE DOMAIN SYSTEMS

John M. Owens, Newport Beach, Calif., assignor to North American Rockwell Corporation

Filed March 12, 1971, Ser. No. 123,638
Int. Cl. G11c *21/00*, *11/14*
U.S. Cl. 340—174 TF 5 Claims



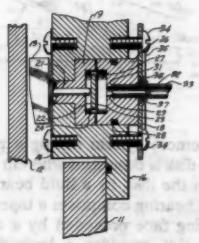
A conductor arrangement for the propagation of single wall domains in a magnetic bubble domain system is disclosed. The conductor arrangement is positioned on top of a strip or channel of film of a magnetic bubble domain material to provide a field gradient which causes the magnetic bubble domain to be moved from a nonrestricted portion through a restricted portion to a second nonrestricted portion of the strip or channel. The conductor arrangement consists of a pair of elongated conductors positioned along and outside of the outer edges of the nonrestricted portion of the strip or channel. These two elongated conductors are connected to each other by conductors which are positioned on top of the restricted strip or channel portions.

3,678,480

COUPLING FOR A PNEUMATIC ACTUATED MAGNETIC HEAD

Alpheus F. Stansell, and Eugene E. Bennett, both of Thousand Oaks, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 2, 1970, Ser. No. 7,463
Int. Cl. G11b *5/60*, *21/20*; F16l *3/04*
U.S. Cl. 340—174.1 E 6 Claims



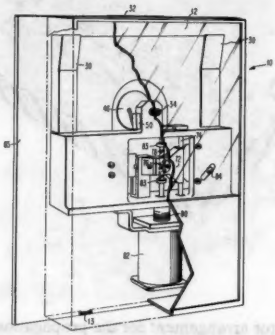
A pneumatic actuating device for a magnetic recording head for a disk memory file or the like is described. Pneumatic pressure is brought to the actuator by an air supply tube which is held in place and also sealed by an O-ring surrounding the tube and compressed between a flat surface and a conical surface so as to squeeze inwardly on the outside wall of the tube. Pneumatic pressure within the assembly acts on a diaphragm to which a rigid disk is attached, and the disk acts on one end of a pin, the other end of which actuates the recording head.

3,678,481

DATA STORAGE APPARATUS EMPLOYING A SINGLE MAGNETIC DISK

Warren L. Dalziel; Jay B. Nilson, and Donald L. Wartner, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 13, 1970, Ser. No. 19,197
Int. Cl. G11b 25/04, 5/54, 5/82
U.S. Cl. 340—174.1 C 6 Claims



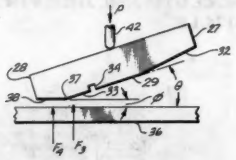
A magnetic disk storage file employs an interchangeable sealed disk cartridge that drops into a guide channel, with the file cover open. When the cover is closed, the disk cartridge is positioned by a centering device, and at the same time is clamped to a rotary drive. Upon energization of a solenoid actuator, the flexible disk is loaded against a magnetic head assembly. The head assembly is mounted to a carriage, enabling direct accessing of the disk radially through an elliptical aperture in the cartridge.

3,678,482

MULTIPLE SURFACE FLUID FILM BEARING

Shahbuddin A. Billawala, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 26, 1970, Ser. No. 67,012
Int. Cl. G11b 5/60, 21/20
U.S. Cl. 340—174.1 E 17 Claims



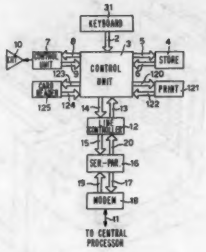
A magnetic memory system having a recording head adjacent a movable disk is described wherein the recording head is separated from the disk by a fluid bearing. In a preferred embodiment, the bearing comprises a taper land bearing having a main bearing face preceded by a converging bearing face. A narrow slot provides a hydrodynamic separation between the trailing edge of the main face and the leading edge of a satellite face coplanar with the main bearing face. A diverging face is provided aft of the satellite face. In operation the recording head is retracted until the disk is up to its usual rotational speed, and then the head is advanced toward the disk to its final floating position in the order of 30 microinches from the surface. The satellite face and diverging face cooperate during the transitional "landing" of the recording head to produce a fluid film force that pivots the recording head to its final floating position without contact between the disk and head.

3,678,483

TERMINAL EQUIPMENT FOR THE TRANSMISSION OF DATA WITH DISPLAY AND INPUT AND OUTPUT UNITS

Antonio Bartocci, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed May 18, 1970, Ser. No. 38,215
Claims priority, application Italy, May 19, 1969, 51906 A/69
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 3 Claims



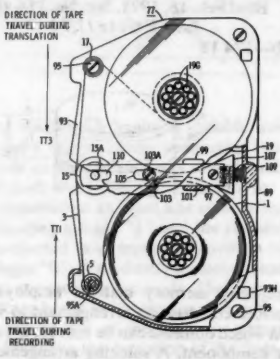
A data communication system comprises a central data processer and a terminal equipment for interrogation of an reply to the processer, said equipment comprising input and output units, a recirculating serial store, a keyboard and a displaying device. The system is provided with a control unit data terminal equipment for interrogation and reply comprising a recirculating serial store, a keyboard for operator control of the equipment and entry of information into the store, a device for displaying the information for transmission and reception respectively, from and to a central data processer, for permitting the dispatch of the information from the store to a peripheral output unit, and also for permitting the input of information coming from a peripheral input unit, and the control unit being responsive to an instruction coming from either the keyboard or from the central processer or from the peripheral input unit to enable the passage of the control unit from various different states into one fixed state capable of producing the said dispatch to the peripheral output unit.

3,678,484

REVERSE-DIRECTION TAPE TRANSLATION

Albert H. Maxwell, Jr., Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1969, Ser. No. 887,682
Int. Cl. G11b 5/02, 19/26; G01r 13/04
U.S. Cl. 340—174.1 H 4 Claims



A tape recorder is provided with a removable tape cartridge unit which contains a pay-out or supply reel and a take-up

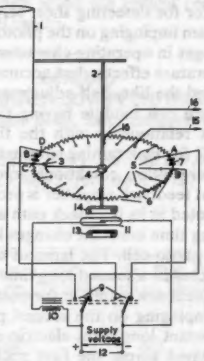
reel. A brake inhibits movement of the reels when the cartridge unit is removed from its operating position. During recording the tape is transferred from the supply to the take-up reel in a first direction. After recording the cartridge is placed in a translation device. The tape is now run in the opposite direction during translation to rewind the tape on the supply reel while carrying out the translating operation.

3,678,485

SHAFT ANGLE TRANSDUCERS

John Ivor Parry Jones, Salisbury, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 6, 1969, Ser. No. 863,881
Int. Cl. G08c *21/00*
U.S. Cl. 340—177 R **15 Claims**



A continuously rotatable and reversible shaft angle transducer on a wind-vane shaft is a rotary potentiometer which in one form has a pair of spaced gaps respectively bridged by a pair of diodes passing current around in only one direction; D.C. supply is connected across one gap by bi-stable switching means which, when the potentiometer brush reaches that gap, transfer the supply connections to the other gap but which restore the first connection when the brush is at said other gap. The output, which is taken — from the brush by a lead and from a point between the gaps another by lead — to a voltmeter, varies over one or other of two ranges according to the position of the bi-stable switching means. The bi-stable switching means can comprise a combination of a relay with a biassed reed switch triggered by a magnet on the shaft. Alternatively the bridging of the first gap by the brush triggers a pair of transistors to reverse the polarity of D.C. supply to the gaps, whereupon supply to the first gap is blocked by diodes but is admitted to the other gap by other diodes; the bridging of the second gap by the brush reverses this action.

In a modification the gaps are located adjacent one another and the D.C. supply is connected to the remote ends of the gaps through resistors; the output is taken from the potentiometer brush by leads, to which one or other pole of the D.C. supply is connected by the bi-stable biassed reed switch triggered by a magnet on the shaft. Alternatively the reversal of supply connections to the common junction of the gaps is by bi-stable combination of a pair of transistors triggered by the bridging of one or the other said gaps.

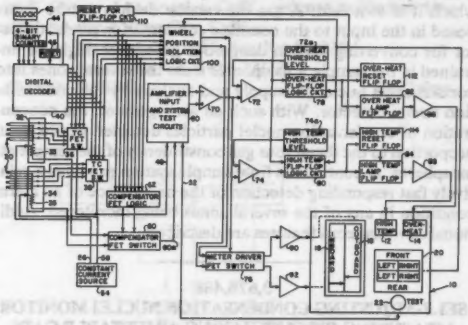
The potentiometer comprises a continuous resistor engaged by a rotary brush, or resistor sections connected to studs engaged by a rotary brush, or resistor sections connected in circuit by magnetic reed switches or by light-sensitive switches.

3,678,486

MONITORING SYSTEM

David P. Bickel, Cuyahoga Falls; Melvin H. Davis, Northfield Center; Karl H. Starks, Jr., Tallmadge, and John Tsoras, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 16, 1969, Ser. No. 866,890
Int. Cl. G08b *17/06, 26/00*
U.S. Cl. 340—227 **6 Claims**



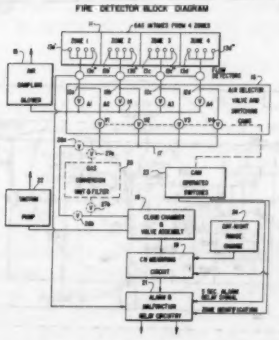
A temperature indication system particularly adapted for brake usages provided which includes a plurality of temperature sensors such as thermocouples cooperating with field effect transistor switches controlled by a digital decoder to effectively pass only one of a plurality of signals entering the switch at one time to a single amplifier. The output of the amplifier may be logically compared to provide a high temperature signal indication, or an exact temperature signal indication, depending upon the readout characteristics desired.

3,678,487

MULTI-ZONE INCIPIENT OR ACTUAL FIRE AND/OR DANGEROUS GAS DETECTION SYSTEM

Frederick A. Ludewig, Jr., Ballston Spa, and Frank W. Van Luik, Jr., Schenectady, both of N.Y., assignors to Environment/One Corporation, Schenectady, N.Y.

Filed Feb. 8, 1971, Ser. No. 113,284
Int. Cl. G08b *19/00*
U.S. Cl. 340—236 **34 Claims**



A multi-zone detecting system for incipient or actual fires and/or dangerous gas accumulations comprising a multi-zone sampling system for obtaining samples of the atmosphere of the respective zones being monitored and supplying the same to a common sampling station. The sample gases are continuously drawn off and supplied through a rotary selector valve sequentially to the input of a common condensation nuclei

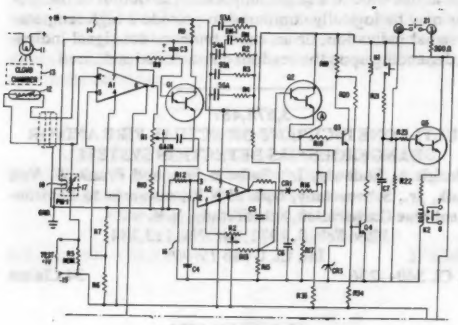
particle detector located at the common sampling station. The sensitivity of the condensation nuclei detector is individually adjusted in synchronism with the operation of the rotary selector valve to adjust the sensitivity of the condensation nuclei detector to the individual background conditions existing in each zone being monitored as the detector is sequentially switched from one zone to the next. The sensitivity of the common condensation nuclei detector is decreased for a predetermined short time settling interval following each sequential switching operation prior to making a measurement with respect to the sample atmosphere of the new zone to which it is switched. A gas conversion device can be interposed in the input to the common condensation nuclei detector for converting certain dangerous gases that might be entrained in the sample atmospheres from the several zones into condensation nuclei for supply and analysis by the condensation nuclei detector. With such an arrangement, the concentration of condensation nuclei particles detected would be in proportion to the dangerous gas constituency of the sample atmospheres. A continuous flow sample system provides a relatively fast responding detection of the occurrence of an alarm condition in any of the several zones being monitored. Additional advantageous features are described.

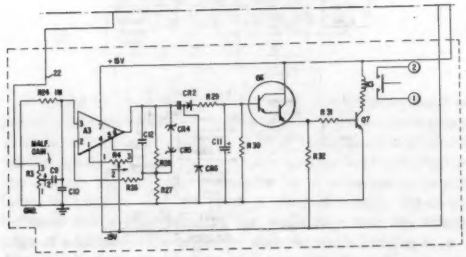
3,678,488

SELF-ADJUSTING CONDENSATION NUCLEI MONITOR MEASURING CIRCUIT HAVING ADJUSTABLE GAIN

George F. Skala, Schenectady, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Filed Feb. 8, 1971, Ser. No. 113,561
Int. Cl. G08b *19/00*
U.S. Cl. 340—236 **20 Claims**





A detecting and amplifying circuit for a multi-zone fire and/or detection system comprising a common sensor-detector located at a control station for detecting and signaling the existence of an alarm condition in any one of the zones being monitored. The common sensor-detector preferably comprises a condensation nuclei monitor and is selectively switched from one zone to the next to monitor conditions in each respective zone sequentially. The rate at which the zones are monitored is relatively rapid on the order of once every 10 minutes or slow depending upon the number of zones, etc. An output feedback amplifier is coupled to the output from the common condensation nuclei sensor-detector for amplifying the output signals derived from the detector. A plurality of gain change resistors are selectively connectable in the feedback path of the output feedback amplifier to adjust its gain selectively to a number of different values. Cam operated switches which are operated synchronously with the selective switching of the common condensation nuclei sensor detector from one zone to the next operate to connect in preselected ones of the resistors into effective circuit relationship in the feedback path of the output feedback amplifier. Consequently, the sensitivity of the overall detecting and amplifying circuit is individually adjusted to background conditions existing in each of the zones being monitored synchronously with the switching of the common condensation nuclei monitor sensor-detector from one zone to the next. The condensation nuclei monitor is of the self-adjusting type including a first photo cell detector for detecting short term changes in light level of a light beam impinging on the photo cell as opposed to longer term changes in operating characteristics of the photo cell due to temperature effects, dust accumulation in the optical path, aging and the like. Self-adjustment is provided by a second lamp-photo cell module having the photo cell connected in circuit relationship with the first nuclei particle sensing photo cell for maintaining substantially constant long term electric energization conditions across the first photo cell. A first output feedback amplifier is provided with the first photo cell connected in its feedback path and is responsive to both fast and long time constant changes in operating conditions of the first photo cell. The lamp of the lamp-photo cell module is connected in a second long time constant feedback path of the first feedback amplifier for controlling the intensity of the light impinging on the second photo cell whereby substantially constant long term electric energization conditions are maintained across the first nuclei particle sensing photo cell. By reason of the inclusion of the feedback lamp-photo cell module in the long time constant feedback path, isolation between the output of the feedback amplifier and the input to the nuclei particle sensing photo cell, is provided.

3,678,489

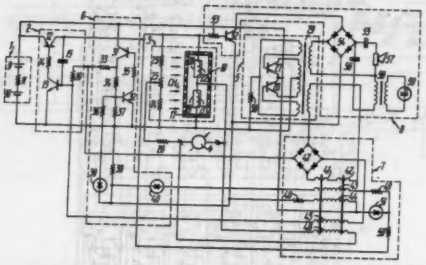
APPARATUS FOR DETERMINING THE CONCENTRATION OF COMBUSTIBLE GASES AND VAPORS

Alexandr Nazarievich Scherban, ulitsa Sverdlova, 10, kv. 31; Neonil Izrailevich Furman, ulitsa Erevanskaya, 10, kv. 2; Boris Feodosievich Sotnichenko, Stavropolsky pereulok, 3, kv. 1; Nikolai Stefanovich Belogolovin, Novo-Pushkinskaya ulitsa, 4, kv. 10; Jury Ivanovich Chopovsky, ulitsa Saxaganskogo, 13, kv. 16; Jury Nikolaevich Sutormin, ulitsa Vilgelma Pika, 24, kv. 48, all of Kiev; Valentin Ivanovich Zaitsev, ulitsa Ostrovskogo, 3, Konotop; Vladimir Ivanovich Kot, ulitsa Ostrovskogo, 6, Konotop; Nikolai Tarasovich Mikhailjuk, ulitsa Ostrovskogo, 8, Konotop; Sergei Andreevich Denisenko, ulitsa Ostrovskogo, 11, Konotop; Anatoly Vasilievich Chaschinov, ulitsa Korolenko, 17, kv. 72, Konotop; Stepan Vasilievich Shaporev, prospekt Lenina, 8, kv. 31, Konotop, and Svetlana Mikhailovna Samollenko, Rusanovskaya naberezhnaya, 22, kv. 83, Kiev, all of U.S.S.R.

Filed Feb. 8, 1971, Ser. No. 113,292
Int. Cl. G08b *21/00*
U.S. Cl. 340—237 R **2 Claims**

An apparatus for determining the concentration of combustible gases and vapors in which there is a control relay which is electrically connected to an a.c. source and which accepts the signal proportional to the concentration of combustible gases and vapors from a catalytic-oxidation transducer and the output signal of which controls a single-shot

multivibrator electrically connected to the catalytic-oxidation transducer and the self-contained d.c. voltage source in such a manner that at the critical concentration of combustible gases and vapors the single-shot multivibrator periodically disconnects the catalytic-oxidation transducer from the self-contained d.c. voltage source and at the same time turns on the alarm unit giving signals about the critical concentration of combustible gases and vapors.

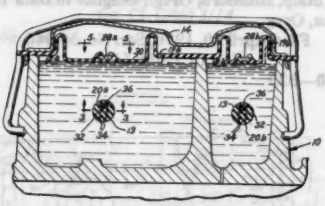


3,678,490

MASTER CYLINDER LOW FLUID INDICATOR

James Basil Putt, South Bend, Ind., assignor to The Bendix Corporation

Filed March 24, 1971, Ser. No. 127,686
Int. Cl. G08b *21/00*; B60t *17/22*
U.S. Cl. 340—244 E **3 Claims**



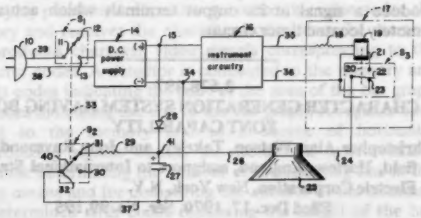
A fluid level warning device for indicating to the driver that an abnormally low supply of fluid is available in the master cylinder reservoir for actuating the brakes of a vehicle. The device includes a horizontally disposed reed switch which is located in the wall of the reservoir and a magnet secured to the reservoir diaphragm for actuating the switch.

3,678,491

INSTRUMENT POWER-DISCONNECT ALARM

Christopher C. Day, Newtonville, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed July 20, 1970, Ser. No. 56,295
Int. Cl. G08b *21/00*
U.S. Cl. 340—253 C **6 Claims**



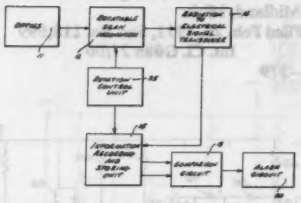
An instrument power-disconnect alarm. Apparatus is disclosed which provides an alarm in the event of inadvertent power disconnection from electronic instrumentation. For normal instrument power turnoff, the alarm is disabled. The present invention is particularly useful in conjunction with instruments used in monitoring, measuring or stimulating bodily function of hospitalized bedridden patients, where accidental power turnoff of a critical electronic instrument could be a matter of life and death.

3,678,492

OPTO-ELECTRONIC SCENE MONITORING SYSTEM

Robert P. Casper, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 26, 1970, Ser. No. 84,028
Int. Cl. G08b *13/18*
U.S. Cl. 340—258 B **10 Claims**



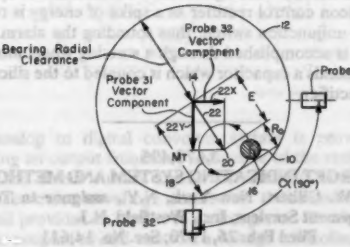
An intrusion detection system is disclosed in which a scene under observation is scanned by a rotatable scanning mechanism with each revolution thereof defining x scene scan periods. Signals from each transducer, associated with the scanning mechanism, are recorded on a magnetic drum. The latter revolves one revolution per y revolutions of the scanning mechanism. Two read heads per transducer are positioned at the drum at a radial angle $\theta = (360/x) \cdot (1/y)$. The signals from the two read heads are compared to provide an alarm indication whenever their difference exceeds a selected threshold level.

3,678,493

MACHINERY SHAFT RADIAL POSITION MONITOR/ALARM SYSTEM

Scott James Shuey, Fullerton, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 21, 1970, Ser. No. 73,992
Int. Cl. G08b *23/00*
U.S. Cl. 340—269 **11 Claims**



A system for monitoring the static and dynamic radial position of a machinery shaft and, if desired, giving an alarm for positions exceeding a pre-set limit. The system was designed for monitoring of large capacity rotating pumps but may find use in other machinery such as turbines, compressors, motors, or the like. Two proximity probes, preferably of the non-contacting type, are positioned adjacent to but spaced from the shaft in a plane perpendicular to its axis along different radii,

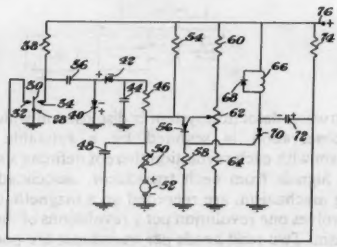
from the nominal shaft center, which radii are preferably separated by 90° of arc. The output from each probe is converted into two signals (d.c. and a.c.) respectively representative of the radial displacements and the dynamic components of motion of the shaft relative to each probe. These four separate signals are then processed to obtain an orbit radius (R_o) signal and an eccentricity (E) signal which may be displayed individually. The R_o and E signals are also summed to produce a total motion (M_T) signal which may be displayed and is also employed to operate an alarm when M_T exceeds a pre-set limit. A preselected time delay is preferably incorporated in the alarm to prevent unnecessary actuations during transient conditions such as at start-up.

3,678,494

SLEEP SENSING APPARATUS FOR USE ON AUTOMOTIVE VEHICLES

Donald D. Setser, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 25, 1971, Ser. No. 118,599
Int. Cl. G08b 21/00
U.S. Cl. 340—279 **4 Claims**



An electrical sensing switch is coupled to the steering mechanism of the vehicle whereby the normal moving of a steering wheel results in frequent movement and actuation of the contacts of the switch.

Actuation of the multi-contact switch depending on movement of the vehicle's steering wheel, results in a cutoff or noncutoff of a unijunction switch, depending on frequency of actuation of the switch, used to control a silicon controlled rectifier in series with an alarm circuit coupled across a power source. A d.c. generator, coupled to the vehicle drive, provides a bucking voltage whose amplitude is speed dependent for adjusting the operation threshold of the unijunction switch.

Lack of normal steering movement results in the operation of the silicon control rectifier as a spike of energy is received from the unijunction switch, thus sounding the alarm. Alarm resetting is accomplished through a steering wheel movement which grounds a capacitor which is coupled to the silicon controlled rectifier.

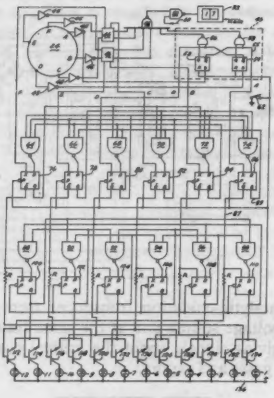
3,678,495

TARGET INDICATING SYSTEM AND METHOD

Roswell W. Gilbert, New York, N.Y., assignor to Technical Management Services, Inc., Westfield, N.J.

Filed Feb. 26, 1970, Ser. No. 14,611
Int. Cl. G08b 27/00
U.S. Cl. 340—323 **23 Claims**

Transducers are spaced evenly in opposed pairs around a metal target. The transducers receive acoustic waves created by bullets striking the target and produce corresponding electrical signals. The approximate "score" of the impact (the distance from the center of the target) is determined by starting a counter with the signal from the first transducer to receive an acoustic wave, and then stopping the counter with the signal from the last transducer to receive the acoustic wave. The approximate azimuth of the impact is determined



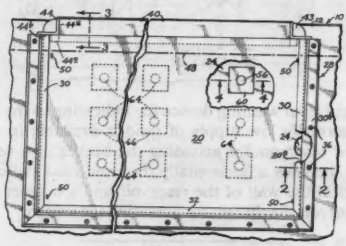
by using the transducer signals and logic circuitry to light one of twelve lamps to indicate in which of 12 sectors of a circle the impact is located.

3,678,496

TOUCH-OPERATED SIGNAL PRODUCER

Bernard J. Stalp, Hillsboro, Oreg., assignor to Data Time, Inc., Beaverton, Oreg.

Filed April 20, 1970, Ser. No. 30,046
Int. Cl. G08b 5/22
U.S. Cl. 340—323 **6 Claims**



A submersible touch-operated signal producer including a pair of spaced, opposed walls sealingly connected at their edges to define a fluid-retaining chamber therebetween. One of the walls is flexible, and when it is touched, it deflects to produce a disturbance in fluid held between the walls. A transducer having a pair of output terminals is mounted in the container and is actuated by such disturbance in such fluid to produce a signal at its output terminals which actuates a remotely located timer circuit.

3,678,497

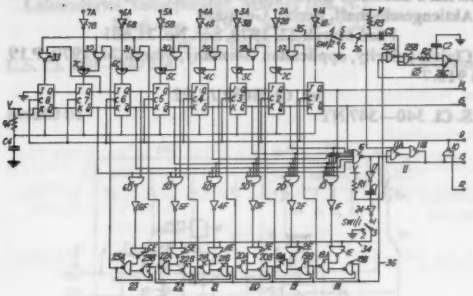
CHARACTER GENERATION SYSTEM HAVING BOLD FONT CAPABILITY

Christopher Alan Watson, Takeley, and John Raymond Maxfield, Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 17, 1970, Ser. No. 99,195
Int. Cl. G06f 3/14
.S. Cl. 340—324 A **18 Claims**

In a character generation system a bold font is generated by causing the last dot of each horizontal line of dots from which

a standard character is formed to be repeated. A loop-gated shift register converter arrangement determines from an inter-



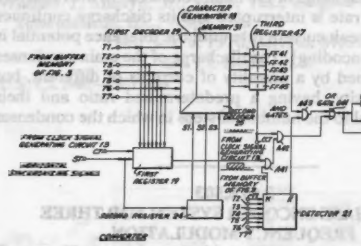
rogated character store output which dot is the last in each horizontal dot row of the selected character, and then presents the next following register stage.

3,678,498

VIDEO DISPLAY SYSTEM INCLUDING RASTER TYPE CATHODE RAY TUBE

Takeo Nagamatsu; Yusaku Yamada, both of Kawasaki, and Kazumi Yamada, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 19, 1970, Ser. No. 81,689
Claims priority, application Japan, Oct. 25, 1969, 44/85421
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A **3 Claims**



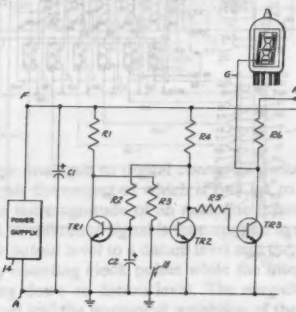
A memory of a video display system including raster type cathode ray tube display means stores character codes, codes indicating the height of a bar graph displayed in a direction perpendicular to the raster trace of the cathode ray tube, codes indicating the start of the area of the bar graph and codes indicating the end of the bar graph in the address corresponding to the display position in the display means. The memory transfers out each code successively in the order of the display position. A character generator is connected to the memory and receives the character codes from the memory and produces character video signals corresponding to the character codes. A detector is connected to the memory and detects codes indicating the start of the area of the bar graph and codes indicating the end of the bar graph. A register connected to the memory and to a source of horizontal synchronizing signals counts the horizontal synchronizing signals for determining the number of the scanning line in the display means and for comparing the number of the scanning line determined with codes indicating the height of the bar graph. A first gate circuit is connected to the character generator and stops the output of the character generator when codes indicating the start of the area of the bar graph are detected by the detector. The first gate circuit transfers the output of the character generator to a video signal amplifier when codes indicating the end of the bar graph are detected by the detector. A second gate circuit connected to a source of clock signals transfers a clock signal for the display of the bar graph to the video signal amplifier when the number of the scanning line is greater than the number corresponding to codes indicating the height of the bar graph as determined by the register.

3,678,499

ELECTRONIC DIGITAL CLOCK POWER FAILURE INDICATOR

Clyde W. McCarty, Woodville, Mass., assignor to General Electric Company

Filed Oct. 27, 1970, Ser. No. 84,410
Int. Cl. G08b *29/00*
U.S. Cl. 340—336 **4 Claims**



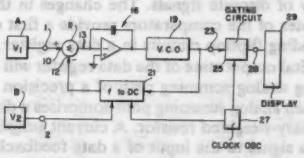
A power failure indicator for an electronic digital clock or similar electronic device with numeral readout components wherein an indicator segment of one of the numeral readout components is utilized for indicating a power failure.

3,678,500

ANALOG DIGITAL CONVERTER

Douglas M. Bauer, Danvers, Mass., assignor to General Electric Company

Filed Aug. 4, 1970, Ser. No. 60,885
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD **4 Claims**

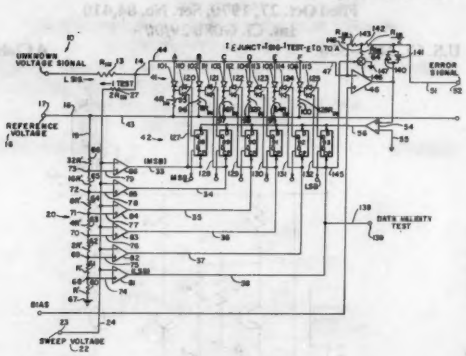


An analog to digital converter system is provided for producing an output frequency indicative of the ratio of first and second direct current signals. A summing circuit has a first direct current voltage connected to its non-inverting input and provides an output to an integrator. The integrator output is coupled to and controls a voltage controlled oscillator which provides a train of output pulses. The second direct current voltage is coupled to a frequency to direct current converter connected in a feedback loop between the oscillator and an inverting input of the summing network. The output of the summing network is thus nulled at a pulse rate proportional to the ratio of the voltages. The output of the voltage controlled oscillator may then be supplied to a digital readout device to provide a visual indication of the ratio of the first and second voltages.

3,678,501
CIRCUIT FOR CONVERTING AN UNKNOWN ANALOG VALUE INTO A DIGITAL VALVE BY SUCCESSIVE APPROXIMATIONS

Robert S. Prill, West Paterson, N.J., assignor to The Singer Company, New York, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,196
Int. Cl. H03k *13/17*
U.S. Cl. 340—347 AD 17 Claims

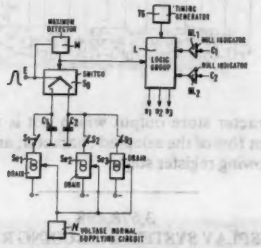


An analog-programmed, successive-approximations, analog to digital/digital to analog (A to D, D to A) converter circuit wherein an unknown analog voltage input signal is converted to a digital output signal. The converter includes an analog programmer comprising a plurality of binary-weighted, series-connected resistors in circuit with a known reference signal to provide weighted, known input signals to each of a plurality of differential comparators. A sweep signal, in circuit with the unknown analog signal, provides a second input to the differential comparators of the analog programmer. The programmer comparators are sequentially switched at known signal magnitudes from one logical state to another to provide a plurality of discrete signals. The changes in the respective output states of the comparators provide a first data input to corresponding flipflop circuits in a data register. A predetermined digital output state of the data register will enable a corresponding analog summing path of a precision D to A converter. Each analog summing path comprises a diode in circuit with a binary-weighted resistor. A current summing amplifier provides a signal to the input of a data feedback comparator which indicates the relative magnitudes of the known input signal and the unknown test signal. When the magnitude of the unnown input signal exceeds the magnitude of a test signal in the circuit, the data feedback comparator produces an output having a predetermined logical state. That predetermined output from the data feedback comparator will cause a predetermined flipflop circuit in the output data register to enable the corresponding analog summing path in the converter circuit means. Conversely, when the magnitude of the input signal is less than the magnitude of the test signal, the corresponding converter analog summing path will remain in its disenabled state. By sequentially switching the programmer comparators at predetermined intervals, the unknown input signal is determined by successively approximating the magnitude of the input signal by successively enabling the signal summing paths in the converter section.

3,678,502
METHOD FOR THE DIGITAL CONVERSION OF AN ANALOG VALUE WITH THE EXTENDED COUNTING PROCESS

Eberhard Kienzler, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed March 23, 1970, Ser. No. 21,681
Claims priority, application Germany, March 24, 1970, P 19 14 916.7
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 NT 10 Claims

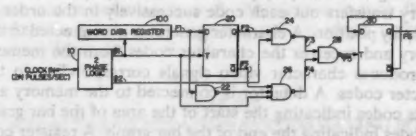


In the digital conversion of an analog value with the extended counting method, the discharge of a first analog memory condenser is started one beat prior to the start of the discharge of a second or main analog condenser at a relatively strong current rate (coarse encoding). When the discharge voltage of the first memory condenser reaches the reference potential, the discharge of the main condenser at the relatively strong current rate is interrupted and its discharge continues at a relatively weak current rate until the reference potential is reached (fine encoding). The discharge of the main condenser is thus performed by a plurality of currents of different, but constant intensity, having a predetermined ratio and their number is equal to the number of steps in which the condenser is discharged.

3,678,503
TWO PHASE ENCODER SYSTEM FOR THREE FREQUENCY MODULATION

George H. Sollman, Cambridge, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed July 6, 1970, Ser. No. 52,327
Int. Cl. H04l *3/00*
U.S. Cl. 340—347 DD 12 Claims

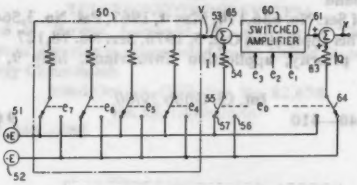


A multiphase encoder translates the bits of a Non-Return-to-Zero digital signal into a three frequency self-clocking signal characterized by having a data transition at the center of a binary ONE bit and a data transition between successive binary ZERO bits.

3,678,504
SEGMENT ANALOG-TO-DIGITAL OR DIGITAL-TO-ANALOG CONVERTER

Hisashi Kaneko, Tokyo, Japan, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 5, 1970, Ser. No. 61,220
Int. Cl. H03k 13/02
U.S. Cl. 340—347 DA 4 Claims

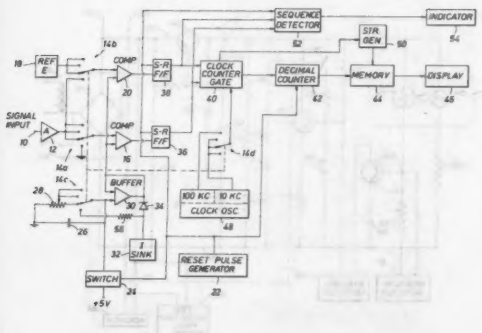


A segment-type decoder in which binary signals representing the mantissa of a digital signal to be decoded are applied to a linear coder component to produce an output current from which there is added to or subtracted a first predetermined current in accordance with a sign bit. The resulting current is applied to a switched amplifier whose gain is determined by the characteristic portion of the digital signal and from whose output is added or subtracted a second predetermined current in accordance with the sign bit to yield an analog representation of the input signal.

3,678,505
SIMULTANEOUS LOGARITHMIC CONVERSION AND DIGITAL DISPLAY APPARATUS

William T. Mostyn, Jr., Waco, Tex., assignor to Musi Conics International, Inc., Waco, Tex.

Filed Nov. 9, 1970, Ser. No. 87,697
Int. Cl. H03k 13/20
U.S. Cl. 340—347 AD 5 Claims

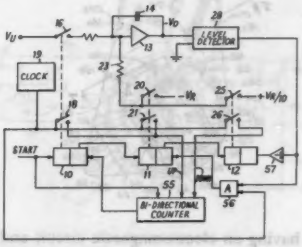


A simultaneous positive or negative logarithm conversion and digital display apparatus utilizing two comparators, one actuated when the exponentially decaying voltage on a capacitor discharging through a shunting resistor reaches the level of a reference voltage and the other actuated when the exponential decaying voltage reaches the level of the measured input signal. A clock generator connected through a gate to a counter provides the means for digitally displaying the logarithmically related time interval during which the counter operates.

3,678,506
TRIPLE-SLOPE ANALOG-TO-DIGITAL CONVERTERS

Desmond Wheable, Farnborough, England, assignor to The Solartron Electronic Group Limited, Farnborough, England

Filed Oct. 2, 1968, Ser. No. 764,490
Claims priority, application Great Britain, Oct. 27, 1967, 48,988/67
Int. Cl. H03k 13/20
U.S. Cl. 340—347 NT 1 Claim

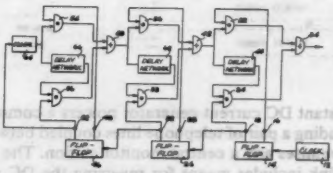


A ramp type analogue to digital converter including an integrating circuit the output of which is first set to a level dependent upon the magnitude of an analogue input voltage to be converted. A reference signal is then applied to ramp down the integrator output level to a datum level and the conversion is effected by counting clock pulses while the integrator output is ramping down to datum level. The magnitude of the reference signal and the numerical weighting of the clock pulses being counted are scaled down by a common factor when the ramp reaches a value close to the datum level so that the slope of the ramp is reduced and the resolution of conversion is increased as it approaches datum. Thus, compared with a ramp type digital voltmeter having a constant slope discharge ramp and a given resolution, the discharge time is reduced for the same resolution of conversions.

3,678,507
CODE COMPRESSION SYSTEM

Ernest I. Rensin, Northridge, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 15, 1969, Ser. No. 885,087
Int. Cl. G06f 5/00, 5/06
U.S. Cl. 340—347 DD 5 Claims

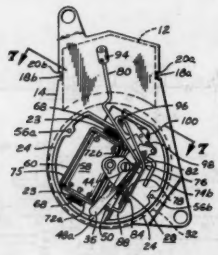


A code compression system whose output is an identical maximal length sequence code at a multiple of an input frequency code. A plurality of identical maximal length sequence codes are provided at a predetermined frequency which are delayed by fixed amounts with respect to each other. The codes are sampled at a rate higher than the frequency of the codes. The sampled codes are then combined to produce the output code at a multiple of the input frequency.

3,678,508
COMPACT FREQUENCY SELECTIVE RINGER

Robert W. Collier, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,051
Int. Cl. G10k *1/064*
U.S. Cl. 340—392 9 Claims

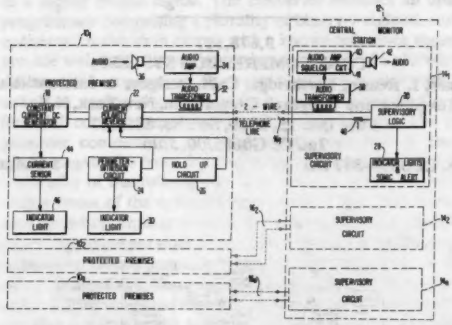


A ringer having an electromagnetic circuit and a movable armature operating a clapper assembly is positioned within a gong so that a clapper strikes the gong upon energization of the electromagnetic circuit. The opening of a resonator is mounted adjacent to the gong. The armature carries a rod which extends out from under the gong and through the opening to carry a weight within the resonator. The weight is used to adjust the frequency response of the ringer.

3,678,509
SECURITY ALARM SYSTEM

Dan Carlo, Bethesda, and James F. Pinkman, Kensington, both of Md., assignors to Multra-Guard, Inc., Rockville, Md.

Filed July 30, 1970, Ser. No. 59,413
Int. Cl. G08b *29/00*
U.S. Cl. 340—409 30 Claims

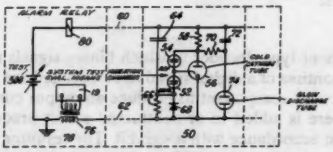


A constant DC current generator powers a communication link including a pair of telephone lines coupled between a protected premises and a central monitor station. The communications link includes means for reversing the DC polarity of the constant current from a predetermined polarity indicative of a normal condition to an opposite polarity in response to a detected alarm condition which occurs in response to a change in the operating parameters of a separate supervisory circuit located at the protected premises. The change in polarity is sensed at the central station and an indication of the alarm condition is presented. DC signalling of the alarm condition as well as the normal condition is thus provided by means of constant current control and DC polarity sensing. Signalling back to the protected premises from the central station is achievable by interrupting the continuity of the communication link and causing the constant current DC generator to sense the open circuit condition. Also when desirable an audio signal is adapted to be transmitted over the communication link from the protected premises to the central station.

3,678,510
FIRE ALARM SYSTEMS EQUIPPED WITH CIRCUIT MONITORING DEVICES

Beat Walthard; Andreas Scheidweiler, and Max Kuhn, all of Stafa, Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Division of Ser. No. 636,174, May 4, 1967, Pat. No. 3,564,524. This application Oct. 5, 1970, Ser. No. 78,127
Claims priority, application Switzerland, May 9, 1966, 6703/66
Int. Cl. G08b *29/00*
U.S. Cl. 340—410 9 Claims



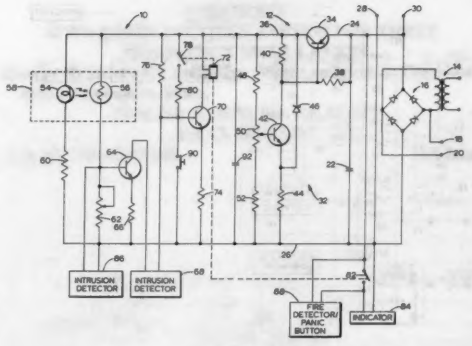
A fire alarm system including a plurality of fire alarms arranged in groups. Alarm-simulating conditions are produced in each fire alarm by an electric test signal, the response of each fire alarm being sent to an evaluation device at a central signal station through a circuit coupling the fire alarms together.

Each alarm generates an oscillation in normal condition which is suppressed in the alarm state.

3,678,511
ALARM CIRCUIT

Elmer M. Benedict, 506 State Street, Schenectady, N.Y.

Filed Dec. 9, 1969, Ser. No. 883,486
Int. Cl. G08b *19/00, 17/10*
U.S. Cl. 340—420 1 Claim



The disclosed embodiment of the invention is a circuit which is responsive to one of a number of abnormal conditions for activating an alarm. The circuit includes a highly regulated power supply formed of a transistor connected in series between an unregulated voltage supply and the detector portion of the circuit. A feedback circuit, which senses voltage fluctuations, controls the level of conduction of the transistor, thereby controlling the voltage drop thereacross to provide a regulated output voltage. A smoke detector is formed of a

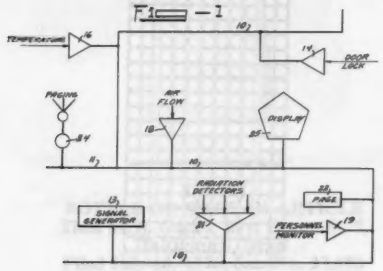
light and a photocell mounted in a smoke chamber, the interior of which is shielded from ambient light. Any increase in the resistor of the photocell caused by the presence of smoke activates, through an amplifier circuit, a latching relay, which in turn activates an alarm. The amplifier circuit is also responsive to either the closing of normally open contacts or the opening of normally closed contacts to actuate the relay. Additional detectors and controls are connected in parallel with the relay contacts which energize the alarm.

3,678,512

TELEMONITORING SYSTEM

Richard W. Fergus, Lombard, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 21, 1970, Ser. No. 82,674
Int. Cl. G08b 26/00
U.S. Cl. 340—408 **5 Claims**



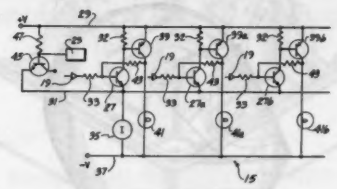
A multistation monitoring system is interconnected by a single cable. Pulses are transmitted over the cable by a signal generator. Each station counts the pulses and upon the receipt of the appropriate pulse each station changes the pulse width according to the data to be transmitted. Provision is also made to transmit control pulses which can be used to activate controls at remote locations.

3,678,513

PEAK SELECTION CIRCUIT AND APPARATUS UTILIZING SAME

William H. Ward, Jr., Huntington Beach, Calif., assignor to General Monitors, Inc., Costa Mesa, Calif.

Filed Oct. 28, 1970, Ser. No. 84,698
Int. Cl. G08b 23/00
U.S. Cl. 340—414 **7 Claims**

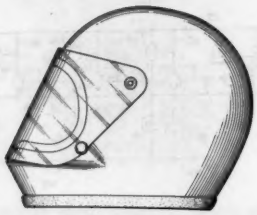


A peak selection circuit connectible to receive several variable amplitude signals for selecting the signal of greatest amplitude and indicating which channel provided such signal. This peak selection circuit can be used, for example, in an apparatus for detecting a gas at first and second locations which comprises a first sensor for providing a first electrical signal having a characteristic variable in accordance with the concentration of the gas at the first location, a second sensor for providing a second electrical signal having a characteristic variable in accordance with the concentration of the gas at the second location, a circuit coupled to the first and second sensors for automatically selecting the signal having the characteristic indicative of the greatest amount of the gas, and an indicator responsive to the selected signal for providing an indication as to which of the signals was selected by the circuit.

DESIGNS

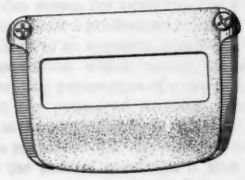
JULY 18, 1972

224,281
HELMET
Victor J. Padilla, 13212 Magnolia, Garden Grove, Calif. 92644
Filed Dec. 4, 1970, Ser. No. 26,293
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232

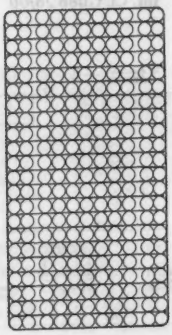


224,282
FACE MASK
Thomas D. Candela, 34 E. 2nd St., New York, N.Y. 10003
Filed Nov. 2, 1970, Ser. No. 25,782
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234

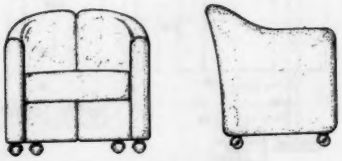
224,283
SLIDER CASING FOR SAFETY BELT
Michel Tixier, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt, and Automobiles Peugeot, Paris, France
Continuation-in-part of design application Ser. No. 19,213, Sept. 19, 1969. This application Sept. 29, 1970, Ser. No. 25,263
Claims priority, application France Mar. 19, 1969
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—408



224,284
BED SPRING UNIT OR SIMILAR ARTICLE
Richard C. Roe, Palatine, Ill., and Wilton J. Davis, Rensselear, Ind., assignors to Sealy, Inc., Chicago, Ill.
Filed Apr. 2, 1970, Ser. No. 22,430
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—2

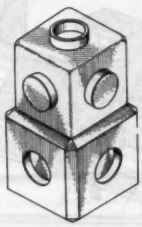


224,285
ARMCHAIR
Eugenio Gerli, Milan, Italy, assignor to Tecno S.p.A., Milan, Italy
Filed July 20, 1970, Ser. No. 24,039
Claims priority, application Italy Jan. 19, 1970
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—71

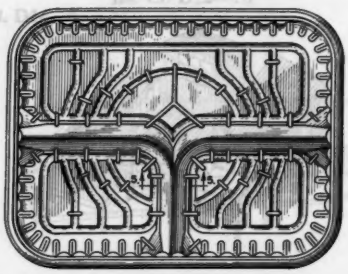


224,286
BOTTLE
Jack H. Rosfeld, Greenville, S.C., assignor to Texize Chemicals, Inc.
Filed Sept. 26, 1968, Ser. No. 13,733
Term of patent 14 years
The portion of the term of the patent subsequent to Aug. 12, 1983, has been disclaimed
Int. Cl. D9—*01*
U.S. Cl. D9—116

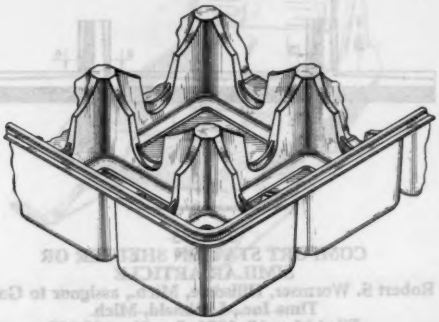
224,287
BOTTLE OR SIMILAR ARTICLE
Theo M. S. Coster, Beyt Horon St. 7, Tel Baruch, Israel
Filed July 10, 1970, Ser. No. 23,893
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—157



224,288
FOOD PACKAGING TRAY
Roy W. Bloch, Northbrook, Ill., assignor to Ekco Products, Inc., Wheeling, Ill.
Filed Sept. 14, 1970, Ser. No. 24,986
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185



224,289
PACKAGING CONTAINER FOR COMESTIBLES OR THE LIKE
Roy W. Bloch, Northbrook, Ill., assignor to Ekco Products, Inc., Wheeling, Ill.
Filed Oct. 28, 1970, Ser. No. 25,690
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—187

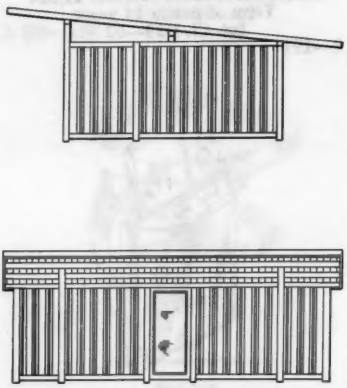


224,290
KNIFE BLADE DISPENSING PACKAGE
John C. Robertson, Orange, N.J., assignor to The Stanley Works, New Britain, Conn.
Filed Feb. 9, 1970, Ser. No. 21,324
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. 9—191

224,291
CAN OR SIMILAR ARTICLE
Carmen T. Mascia, Westmont, and Richard D. Bagguley, Dolton, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
Filed June 1, 1971, Ser. No. 148,665
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

224,292
BUILDING FRAME MEMBER
James Franklin McCaul III, Birmingham, Ala., assignor to Schokbeton Products Corp., Birmingham, Ala.
Filed Aug. 14, 1970, Ser. No. 24,495
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

224,293
COMFORT STATION SHELTER OR SIMILAR ARTICLE
Robert S. Wormser, Hillsdale, Mich., assignor to Game Time Inc., Litchfield, Mich.
Filed Mar. 18, 1971, Ser. No. 125,908
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

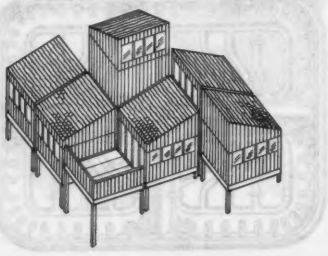


224,294
MOTEL OFFICE BUILDING
Howard L. Schwartz, Miami Beach, Fla., assignor to United Inns Mfg. Corp., Kansas City, Mo.
Filed May 3, 1971, Ser. No. 140,021
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

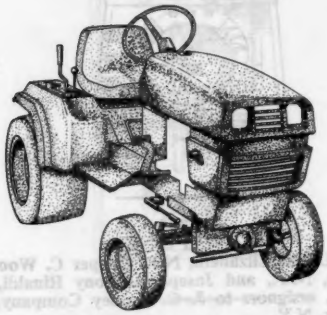
224,295
PRE-ASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, 280 Vandervilt Ave., Brooklyn, N.Y. 11205
Filed May 14, 1971, Ser. No. 143,725
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

224,296
PRE-ASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, 280 Vanderbilt Ave., Brooklyn, N.Y. 11205
Filed May 14, 1971, Ser. No. 143,726
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

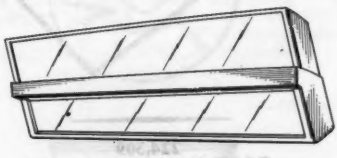
224,297
PRE-ASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, 280 Vanderbilt Ave., Brooklyn, N.Y. 11205
Filed May 14, 1971, Ser. No. 143,727
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1



224,298
LAWN AND GARDEN TRACTOR
Constantine J. Kermes, Lancaster County, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.
Filed Oct. 5, 1970, Ser. No. 25,343
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3



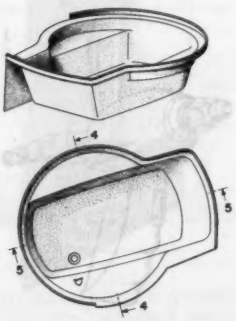
224,299
REAR VIEW MIRROR
Lynn Harold Hodge, 12618 Wyoming Ave., Detroit, Mich. 48238
Filed Aug. 17, 1970, Ser. No. 24,532
Term of patent 3½ years
Int. Cl. D12—*16*
U.S. Cl. D14—6



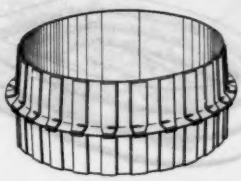
224,300
REAR VIEW MIRROR
Lynn Harold Hodge, 12618 Wyoming Ave., Detroit, Mich. 48238
Filed Aug. 17, 1970, Ser. No. 24,535
Term of patent 3½ years
Int. Cl. D12—*16*
U.S. Cl. D14—6

224,301
SNOWMOBILE
Terry D. Swan, 420 43rd St., Richmond, Calif. 94805
Filed May 25, 1970, Ser. No. 23,131
Term of patent 7 years
Int. Cl. D12—*13*
U.S. Cl. D14—24

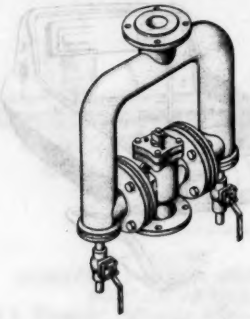
224,302
BATHTUB
James A. Tiller, 3801 Kingswood Drive, Decatur, Ga. 30032
Filed May 18, 1970, Ser. No. 23,053
(Filed under Rule 47(b) and 35 U.S.C. 118)
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



224,303
COUPLING RING FOR DRAINAGE PIPES
Hakan Georg Fritiof Bergkvist, Vastbovagen 47, S–331 00 Varnamo, Sweden
Filed Nov. 20, 1970, Ser. No. 26,091
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—43

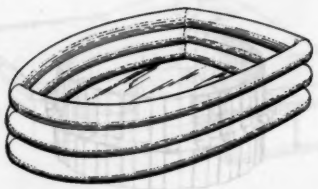


224,304
DUPLEX STRAINER UNIT
Russell G. Smith, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio
Filed Sept. 8, 1970, Ser. No. 24,883
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

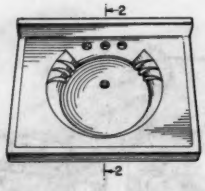


224,305
PLURAL FLUID CONTROL MIXING AND SPRAY GUN
Wallace F. Krueger, 4401 Merriweather Road, Toledo, Ohio 43623
Filed June 8, 1970, Ser. No. 23,367
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17

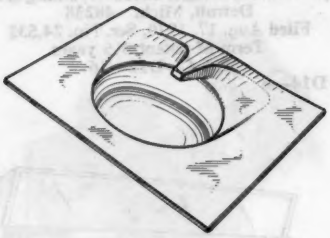
224,306
BABY BATH
John P. Anderson, 9621 Clearbrook Drive, Huntington Beach, Calif. 92646
Filed Sept. 15, 1970, Ser. No. 25,014
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—52



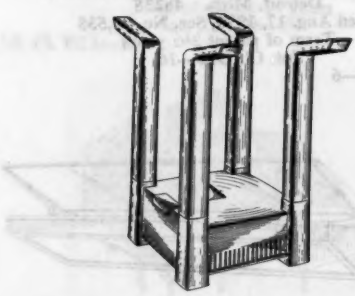
224,307
INTEGRAL COUNTER TOP AND LAVATORY
David L. Bogna, 16814 Blackhawk St., Granada Hills, Calif. 91344
Filed Jan. 5, 1971, Ser. No. 104,193
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



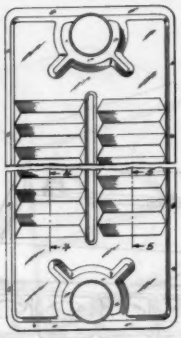
224,308
VANITY SINK
Donald G. Lauer, Elizabeth, N.J., Cooper C. Woodring, Plandome, N.Y., and Joseph Anthony Rinaldi, Fort Lee, N.J., assignors to J. C. Penney Company, Inc., New York, N.Y.
Filed Jan. 6, 1971, Ser. No. 104,530
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



224,309
BOOT AND SHOE DRYER
Martin J. Wolff, West Haven, Conn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Apr. 26, 1971, Ser. No. 137,742
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—77

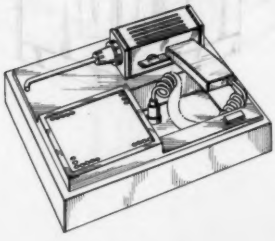


224,310
COOLING PANEL
Edward J. Clarkin, Florissant, Mo., assignor to Nooter Corporation, St. Louis, Mo.
Filed Jan. 6, 1971, Ser. No. 104,547
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—127



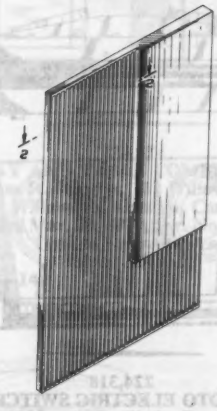
224,311
FLOAT FOR SANITIZING AGENT DISPENSER
James E. Brett, Redondo Beach, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.
Filed Mar. 15, 1971, Ser. No. 124,658
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—150

224,312
HAND-HELD ULTRAVIOLET LIGHT UNIT FOR DENTAL USE
Ronald C. Webb, York, Pa., and Gerald L. Lenz, East Brunswick, N.J., assignors to Conrad Precision Industries, Inc.
Filed Mar. 15, 1971, Ser. No. 124,083
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1



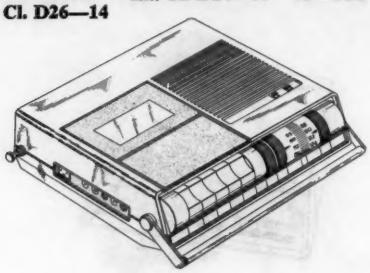
224,313
MAGNETIC TAPE CASSETTE TRANSPORT
Hari K. Matsuda, Evanston, Ill., assignor to Ampex Corporation, Redwood City, Calif.
Filed June 3, 1971, Ser. No. 149,883
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

224,314
PANEL FOR USE ON ELECTRONIC EQUIPMENT CABINETS OR THE LIKE
Carl Frederick Schaus, Ballston Lake, N.Y., assignor to Honeywell Information Systems Inc.
Filed Dec. 2, 1970, Ser. No. 26,248
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

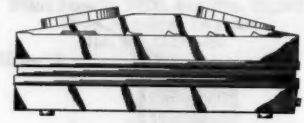


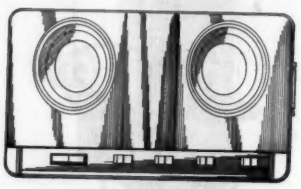
224,315
MAGNETIC TAPE CASSETTE TRANSPORT
Donald E. Leman, Des Plaines, Ill., assignor to Ampex Corporation, Redwood City, Calif.
Filed June 1, 1971, Ser. No. 149,101
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

224,316
COMBINED MAGNETIC TAPE CASSETTE TRANSPORT AND RADIO
Orville W. Larson, Elmhurst, Ill., assignor to Ampex Corporation, Redwood City, Calif.
Filed June 1, 1971, Ser. No. 149,096
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

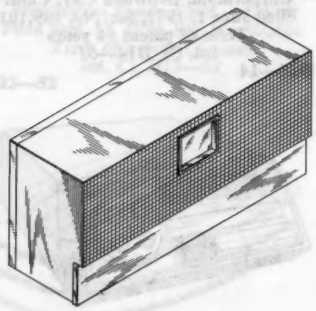


224,317
ACOUSTIC COUPLER
Joseph P. Marsalka and John P. Kennedy, Columbus, Ohio, assignors to Design Elements, Inc., Columbus, Ohio
Filed June 23, 1971, Ser. No. 156,153
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

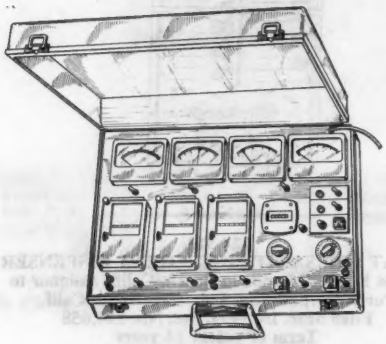




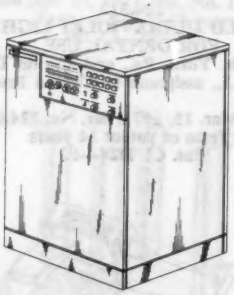
224,318
PHOTO ELECTRIC SWITCH
Robert D. Kahn, Rockville Centre, N.Y., assignor to Fedtro, Inc., Rockville Centre, N.Y.
Filed Jan. 22, 1971, Ser. No. 109,090
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1



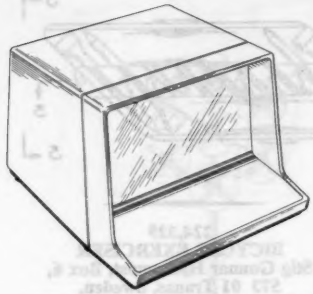
224,319
ELECTRIC SOLDERING EQUIPMENT MATCHING INSTRUMENT
Joseph A. Sylvester, Wayne, N.J., assignor to Hexacon Electric Company
Filed Nov. 10, 1970, Ser. No. 25,924
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D26—1



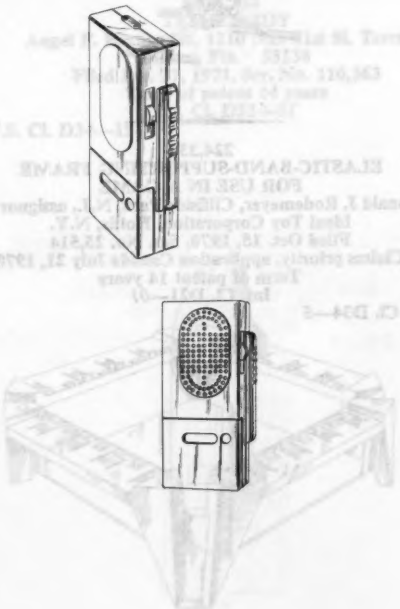
224,320
DATA PROCESSING UNIT
Myron F. Davis and Walter Furlani, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 26, 1970, Ser. No. 25,656
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



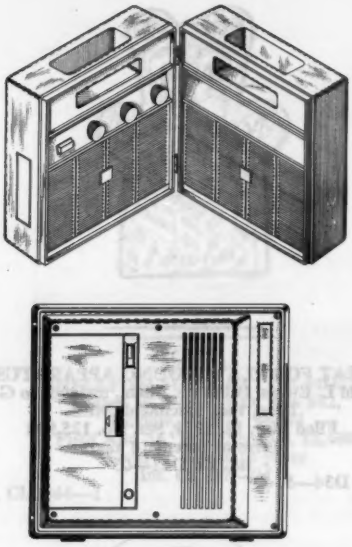
224,321
KEYBOARD OPERATED DISPLAY CONSOLE
Allen R. Williams, Jr., Lynnfield, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Feb. 22, 1971, Ser. No. 117,594
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



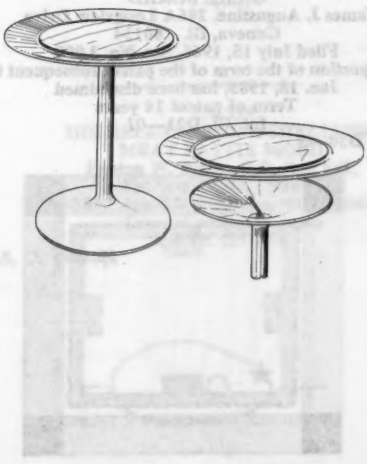
224,322
TAPE RECORDER
Manfred Paul Tupaj, Grobenzell, and Heinz Engert, Munich Untermenzing, Germany, assignors to Sud-Atlas-Werke G.m.b.H., Munich, Germany
Filed Sept. 15, 1970, Ser. No. 25,013
Claims priority, application Germany Mar. 23, 1970
Term of patent 3½ years
Int. Cl. D14—*01*
U.S. Cl. D26—14



224,323
PORTABLE TAPE PLAYER
Richard H. Seager, Manlius, N.Y., assignor to General Electric Company
Filed June 23, 1971, Ser. No. 156,173
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



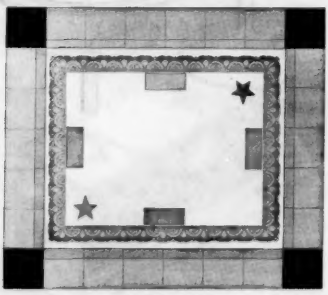
224,324
TRAY AND TABLE COMBINATION
William H. Wiggins, 137 Willowdale Ave., Willowdale, Ontario, Canada
Filed Mar. 23, 1970, Ser. No. 22,007
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14



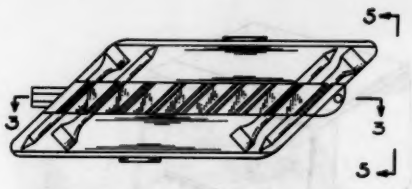
224,325
ANIMAL FIGURE HAND PUPPET
Marie H. Frost, Wheaton, and Russell B. Odell, Elgin, Ill., assignors to David C. Cook Publishing Company, Elgin, Ill.
Filed Feb. 16, 1971, Ser. No. 115,941
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—2

224,326
SEAT FOR PLAYGROUND APPARATUS
Ronald L. Ewers, Hillsdale, Mich., assignor to Game Time, Inc., Litchfield, Mich.
Filed Mar. 18, 1971, Ser. No. 125,902
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

224,327
GAME BOARD
James J. Augustine, 206A Longview Drive, Geneva, Ill. 60134
Filed July 15, 1966, Ser. No. 3,090
The portion of the term of the patent subsequent to Jan. 18, 1983, has been disclaimed
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

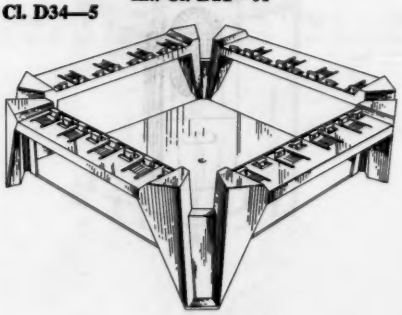


224,328
COMBINED GOLF ACCESSORIES AND HOLDER THEREOF
Edward L. Cicero, 52—62 66th St., Maspeth, N.Y. 11378
Filed Sept. 9, 1970, Ser. No. 24,902
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5



224,329
BICYCLE EXERCISER
Stig Gunnar Hjelmquist, Box 6, 573 01 Tranas, Sweden,
Filed Apr. 5, 1971, Ser. No. 131,578
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

224,330
ELASTIC-BAND-SUPPORTING FRAME FOR USE IN A GAME
Donald J. Rodemeyer, Cliffside Park, N.J., assignor to Ideal Toy Corporation, Hollis, N.Y.
Filed Oct. 15, 1970, Ser. No. 25,514
Claims priority, application Canada July 21, 1970
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



224,331
PINWHEEL TOY OR SIMILAR ARTICLE
Arthur Halpern, New York, N.Y., assignor to M. I. Sales Co., Inc., New York, N.Y.
Filed Mar. 1, 1971, Ser. No. 122,653
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

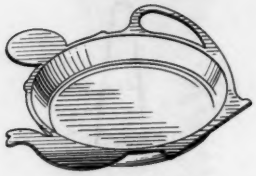
224,332
TETHER TOY
Angel F. Hernandez, 1210 NE. 81st St. Terrace, Miami, Fla. 33138
Filed Jan. 27, 1971, Ser. No. 110,363
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

224,333
ADJUSTABLE FLOWER POT HOLDER
Samuel P. Kelly, 806 Grand Ave., Fort Worth, Tex. 76106
Filed Oct. 27, 1970, Ser. No. 25,686
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3

224,334
SHELLFISH MEAT PATTIE MOLD
Fenton W. Prehn, P.O. Box 842, Seaview, Wash. 98644
Filed Apr. 16, 1970, Ser. No. 22,460
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—1

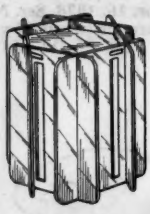
224,335
DIE RELEASE FOR A SHELLFISH MEAT PATTIE MOLD
Fenton W. Prehn, P.O. Box 842, Seaview, Wash. 98644
Filed Apr. 16, 1970, Ser. No. 22,468
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—1

224,336
SAUCER FOR A TEA BAG OR THE LIKE
David M. Shatan, Mamaroneck, N.Y., assignor to Presto Plastics Corporation, Mamaroneck, N.Y.
Filed Oct. 9, 1970, Ser. No. 25,419
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D44—9



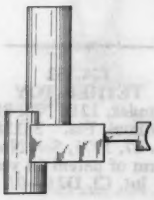
224,337
COMBINED KNIFE SHARPENER AND MEAT CARVING FORK
Rinzy Nocero, 181 73rd St., Brooklyn, N.Y. 11209
Filed May 25, 1971, Ser. No. 146,857
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—29

224,338
TABLE LAMP
Alfredo Martini, Via della Giardina, Monza, Italy, and Roberto Coizet, Pizza Oberdan 4, Milan, Italy
Filed Oct. 19, 1970, Ser. No. 25,537
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

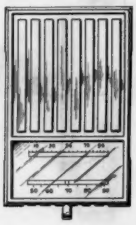


224,339
CIGARETTE LIGHTER
Kenjiro Goto, Tokyo, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kawaguchi-shi, Saitama, Japan
Filed May 24, 1971, Ser. No. 146,600
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

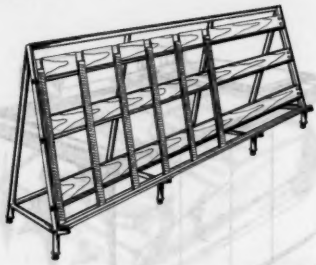
224,340
DISC DISPENSER
Walter Swirple, 8444 Lochdale, Dearborn Heights, Mich. 48127
Filed Apr. 21, 1971, Ser. No. 136,284
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D52—2



224,341
THERMOSTAT HOUSING
Anthony C. Cairo, Holland, Mich., assignor to Simicon Company, Holland, Mich.
Filed Sept. 16, 1970, Ser. No. 25,019
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—7



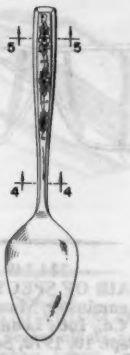
224,342
PALLET MAKING JIG
Irving Dumm III, 8297 Oak Knoll Drive, Roseville, Calif. 95678, and Robert A. Wilson, 8821 Etiwanda Ave., Etiwanda, Calif. 91739
Filed Aug. 28, 1970, Ser. No. 24,747
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D54—1



224,343
FORK OR SIMILAR ARTICLE OF FLATWARE
Ignacio Arcocha Basterra, La Vega s/n Guernica, Spain
Filed July 17, 1970, Ser. No. 24,238
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

224,344
FORK OR SIMILAR ARTICLE OF FLATWARE
Ignacio Arcocha Basterra, La Vega s/n Guernica, Spain
Filed July 17, 1970, Ser. No. 24,645
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

224,345
SPOON OR SIMILAR ARTICLE OF FLATWARE
William J. Knope, Meriden, Conn., assignor to International Silver Company, Meriden, Conn.
Filed Feb. 1, 1971, Ser. No. 111,794
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12



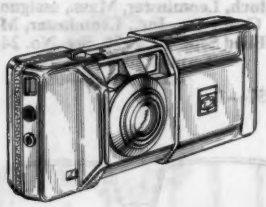
224,346
TELEVISION RECEIVER
Yasunobu Nakamura, Suita, Tadashi Sumino, Osamu Sugihara and Kazuhiro Ueda, Takatsuki, and Makoto Terauchi, Ibaragi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 15, 1971, Ser. No. 124,651
Claims priority, application Japan Sept. 16, 1970
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

224,347
PAIR OF SPECTACLES
Jack Bloch, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed Sept. 10, 1970, Ser. No. 24,928
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1

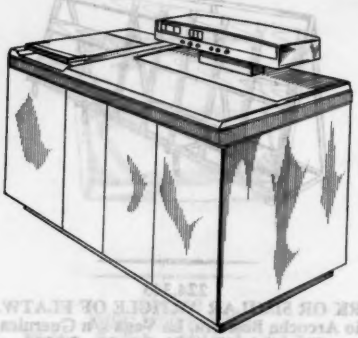
224,348
PAIR OF SPECTACLES
Jack Bloch, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed Sept. 10, 1970, Ser. No. 24,931
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1

224,349
PAIR OF SPECTACLES
Jack Bloch, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed Sept. 10, 1970, Ser. No. 24,932
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1

224,350
CAMERA
Masahiro Fukuda, Kawasaki-shi, Japan, assignor to Fuji Shashin Film Kabushiki Kaisha, Minamiashigara-machi, Ashigarakami-gun, Kanagawa-ken, Japan
Filed Sept. 11, 1969, Ser. No. 19,118
Claims priority, application Japan Apr. 9, 1969
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1

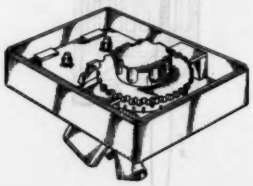


224,351
OFFICE COPIER
Earl E. Hoyt, Washington Township, Bergen County, N.J., assignor to Van Dyk Research Corporation, Whippany, N.J.
Filed June 1, 1970, Ser. No. 23,233
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D61—1

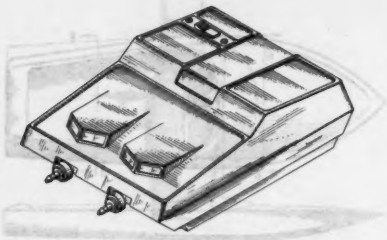


224,352
DESK ELECTRONIC CALCULATOR
Tatsuya Mikami, Narashino, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Oct. 15, 1970, Ser. No. 25,506
Claims priority, application Japan Apr. 16, 1970
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

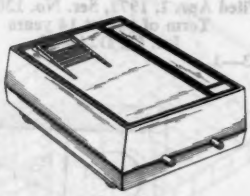
224,353
TAPE PRINTER OR SIMILAR ARTICLE
Fred C. Rosenow, Northridge, Calif., assignor to Data Collection Systems, Inc., Northridge, Calif.
Filed Sept. 22, 1970, Ser. No. 25,134
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—10



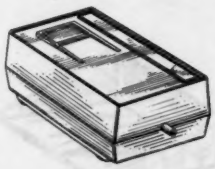
224,354
AIR-PUMP FOR AQUARIUM OR THE LIKE
Ryozo Kondo, 972 Tsutsumikata-machi Ohta-ku, Tokyo, Japan
Filed Aug. 21, 1970, Ser. No. 24,625
Term of patent 3½ years
Int. Cl. D15—*02*
U.S. Cl. D65—1



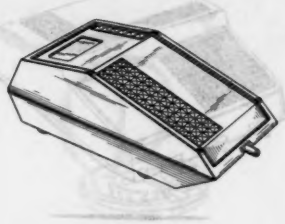
224,355
AIR-PUMP FOR AQUARIUM OR THE LIKE
Ryozo Kondo, 972 Tsutsumikata-machi, Ohta-ku, Tokyo, Japan
Filed Nov. 16, 1970, Ser. No. 25,989
Term of patent 3½ years
Int. Cl. D15—*02*
U.S. Cl. D65—1



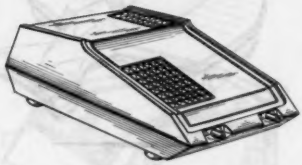
224,356
AIR-PUMP FOR AQUARIUM OR THE LIKE
Ryozo Kondo, 972 Tsutsumikata-machi, Ohta-ku, Tokyo, Japan
Filed Nov. 16, 1970, Ser. No. 26,011
Term of patent 3½ years
Int. Cl. D15—*02*
U.S. Cl. D65—1



224,357
AIR-PUMP FOR AQUARIUM OR THE LIKE
Ryozo Kondo, 972 Tsutsumikata-machi, Ohta-ku, Tokyo, Japan
Filed Nov. 16, 1970, Ser. No. 26,012
Term of patent 3½ years
Int. Cl. D15—*02*
U.S. Cl. D65—1



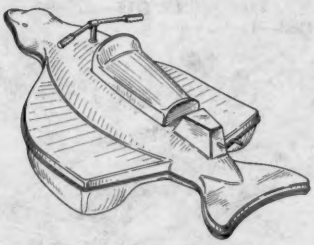
224,358
AIR-PUMP FOR AQUARIUM OR THE LIKE
Ryozo Kondo, 972 Tsutsumikata-machi, Ohta-ku, Tokyo, Japan
Filed Nov. 16, 1970, Ser. No. 26,017
Term of patent 3½ years
Int. Cl. D15—*02*
U.S. Cl. D65—1



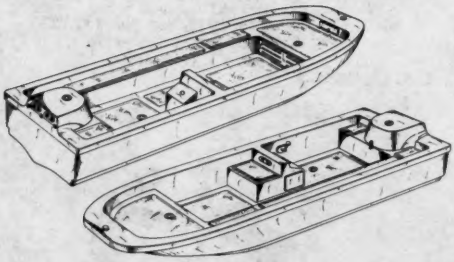
224,359
AQUARIUM AIR-PUMP OR THE LIKE
Ryozo Kondo, 972 Tsutsumikata-machi, Ohta-ku, Tokyo, Japan
Filed Apr. 26, 1971, Ser. No. 137,729
Term of patent 3½ years
Int. Cl. D15—*02*
U.S. Cl. D65—1

224,360
AQUARIUM AIR-PUMP OR THE LIKE
Ryozo Kondo, 972 Tsutsumikata-machi, Ohta-ku, Tokyo, Japan
Filed June 16, 1971, Ser. No. 137,730
Term of patent 3½ years
Int. Cl. D15—*02*
U.S. Cl. D65—1

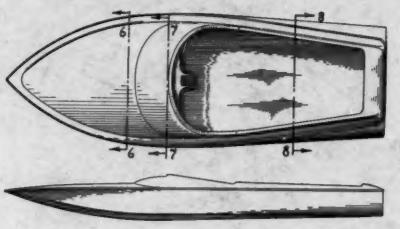
224,361
DOLPHIN-SHAPED BOAT
Robert A. Nelson, Guelph, Ontario, Canada, assignor to Everett A. E. Fagg, Mississauga, Ontario, Canada
Filed Sept. 21, 1970, Ser. No. 25,075
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D71—1



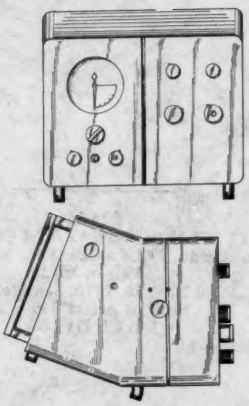
224,362
BOAT
William H. Wilson, Fort Smith, Ark., assignor to Rebel Boat Company, Inc., Fort Smith, Ark.
Filed Dec. 28, 1970, Ser. No. 26,660
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



224,363
BOAT HULL
Jack Davidson, 3316 E. Annadale, Fresno, Calif. 93725
Filed Feb. 11, 1971, Ser. No. 114,741
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1

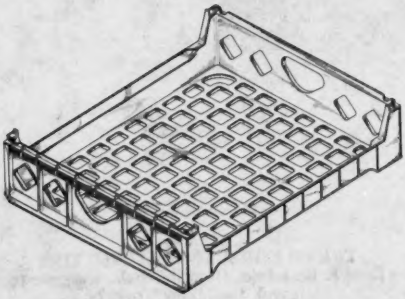


224,364
AUTOMATIC LUNG VENTILATOR
Douglas James Warner, Berkeley, and Arnold Wolf, Los Angeles, Calif., assignors to Veriflo Corporation, Richmond, Calif.
Filed Apr. 1, 1971, Ser. No. 130,546
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1

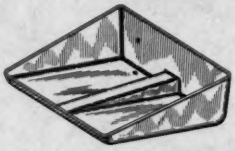


224,365
SHOE HORN
Gerald D. Lewis, 8221 Deerfield Drive, Huntington Beach, Calif. 92646
Filed Oct. 19, 1970, Ser. No. 25,555
Term of patent 14 years
Int. Cl. D28—*99*
U.S. Cl. D86—10

224,366
BREAD TRAY
Houston Rehrig, Pasadena, Calif. (4291 Bandini Blvd., Los Angeles, Calif. 90023)
Filed Oct. 27, 1970, Ser. No. 25,683
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1

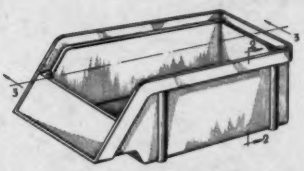


224,367
PNEUMATIC TUBE SYSTEM CARRIER STORAGE TRAY
William H. Terrell, Akron, Ohio, assignor to Diebold, Incorporated, Canton, Ohio
Filed Nov. 5, 1970, Ser. No. 26,427
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D87—1

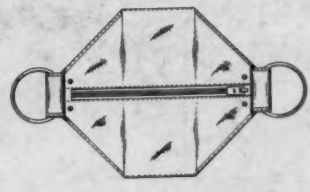


224,368
BOX FOR AN ELECTRIC SHAVER
Franco Bettonica, Milan, Italy, assignor to U.S. Philips Corporation
Filed Nov. 19, 1970, Ser. No. 26,240
Claims priority, application Switzerland May 21, 1970
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1

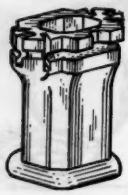
224,369
STORAGE BIN
Fred Mears, Hempstead, N.Y., assignor to G. B. Lewis Company, Watertown, Wis.
Continuation of design application Ser. No. 8,709, July 21, 1967. This application Dec. 19, 1969, Ser. No. 20,447
Term of patent 14 years
Int. Cl. D3—*99;* D9—*03*
U.S. Cl. D87—1



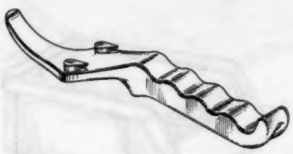
224,370
TOTE BAG
Morris J. Berry, Brooklyn, N.Y., assignor to Fashioncraft-Excello, Brooklyn, N.Y.
Filed Nov. 12, 1970, Ser. No. 25,946
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3



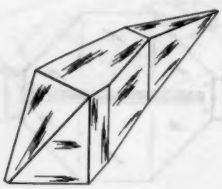
224,371
UMBRELLA RUNNER
Kazuo Kokado, 1/3 Higashi-Imazato 2-chome, Higashinari-ku, Osaka, Japan
Filed Apr. 30, 1971, Ser. No. 139,321
Term of patent 7 years
Int. Cl. D3—*03*
U.S. Cl. D88—3



224,372
CITRUS FRUIT PEELER
Christopher H. Clarke, 1575 Homewood Drive, Altadena, Calif. 91001
Filed Mar. 12, 1971, Ser. No. 123,936
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D89—1

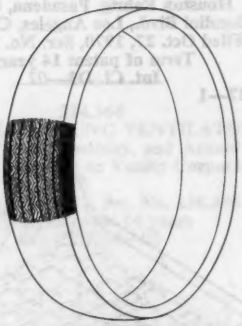


224,373
BICYCLE COVER
Joseph A. Lischeron, 1048 Pelissier St., Windsor, Ontario, Canada
Filed Dec. 28, 1970, Ser. No. 26,644
Term of patent 3½ years
Int. Cl. D12—*16*
U.S. Cl. D90—6

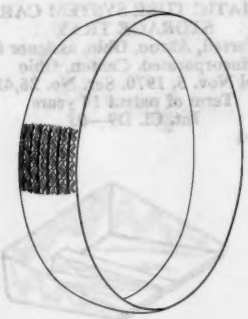


224,374
VELOCIPEDE FRAME
Raymond Boucher, Dothan, Ala., and Charles Voytko, Johnstown, Pa., assignors to Hedstrom Company, Bedford, Pa.
Filed Oct. 8, 1970, Ser. No. 25,398
Term of patent 7 years
Int. Cl. D12—*11*
U.S. Cl. D90—8

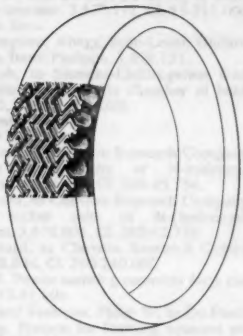
224,375
PNEUMATIC TIRE TREAD AND BUTTRESS
Marco Maxemovich, Warren, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed July 22, 1969, Ser. No. 18,306
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



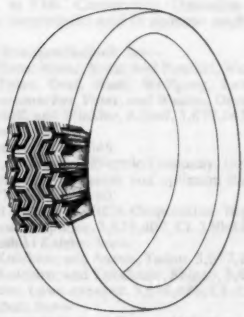
224,376
TREAD FOR A PNEUMATIC TIRE
Dale J. Beaudoin, Detroit, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed July 22, 1969, Ser. No. 18,307
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



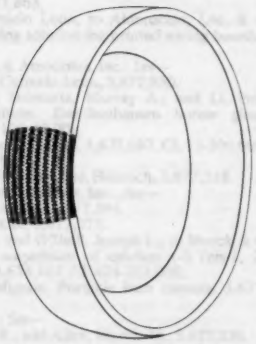
224,377
PNEUMATIC TIRE TREAD AND BUTTRESS
James F. Newman, St. Clair Shores, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed Aug. 15, 1969, Ser. No. 18,704
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



224,378
PNEUMATIC TIRE TREAD AND BUTTRESS
James F. Newman, St. Clair Shores, Mich., assignor to Uniroyal, Inc., New York, N.Y.
Filed Aug. 15, 1969, Ser. No. 18,706
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



224,379
PNEUMATIC TIRE TREAD AND BUTTRESS COMBINATION
Robert F. Busch, St. Clair Shores, and William K. Pope, Detroit, Mich., assignors to Uniroyal, Inc., New York, N.Y.
Filed Sept. 9, 1969, Ser. No. 19,071
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D90—20



224,380
DRY SHAVER
Maarten Willem van Lelyveld, Drachten, Netherlands, assignor to U.S. Philips Corporation
Filed Oct. 9, 1970, Ser. No. 25,421
Claims priority, application Switzerland Apr. 17, 1970
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3

LIST OF PATENTEES

TO WHOM

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AB Instrumenta: *See*—
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Abbott Laboratories: *See*—
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Abbott, Malcolm K.; and Dowdy, David A., to Bendix Corporation, The. Diaphragm trimmer. 3,677,118, Cl. 83-211.000.

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Ackermann, Joseph, to Siemens-Elektrogerate GmbH. Device for cleaning the walls of the muffle chamber of baking and roasting ovens. 3,678,245, Cl. 219-396.000.

Actmedia, Inc., mesne: *See*—
Hedu, Jon, 3,677,570.

Adams, John Howard, to Chevron Research Company. Polypropylene stabilized with metal salts of N-hydroxyalkylbenzyl alkylenepolyamines. 3,678,000, Cl. 260-45.75n.

Adams, John Howard, to Chevron Research Company. Polypropylene stabilized by nickel salts of N-(hydroxyalkylbenzyl) alkylenepolyamines. 3,678,001, Cl. 260-45.75n.

Adams, John Howard, to Chevron Research Company. Substituted flavanones. 3,678,044, Cl. 260-240.00f.

Adams, Madison B. Power assisting assembly for a clutch mechanism. 3,677,379, Cl. 192-91.00r.

Adams, Philip E.; and Fearnow, Philip W, to Du Pont de Nemours, E. I., and Company. Process for foaming aqueous protein-containing blasting agents. 3,678,140, Cl. 149-109.000.

Adams, Wade L. Duct assembly unit for air-water induction system of air conditioning in multi-story buildings. 3,677,285, Cl. 137-357.000.

Adamson, Wayne G., to Square D Company. Handle locking attachment for electrical control devices. 3,678,228, Cl. 200-42.00t.

Addmaster Corporation: *See*—
Grey, Michael W., 3,677,463.

Adkins, Murray R. Rotary engine. 3,677,235, Cl. 123-8.350.

Adler, Robert, to Zenith Radio Corporation. Solid-state traveling-wave amplification system. 3,678,401, Cl. 330-5.5.

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Maleck, Le Roy R., 3,676,896.

Afdahl, Ronald L.; and Barber, Harold W., to Phillips Petroleum Company. Treatment of hydrocarbon gases. 3,676,981, Cl. 55-30.000.

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Agafonov, Nikolai Georgievich: *See*—
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Ager, John W., to FMC Corporation. Oxidation of p-xylene and p-toluic acid to terephthalic acid in aqueous medium. 3,678,106, Cl. 260-524.00r.

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Agristeel Limited: *See*—
Gugin, Robert J., 3,677,349.

Ahmed, Nazeer, to Western Electric Company, Incorporated. Method of positive fluid flow extrusion and optimum fluid control element therefor. 3,677,050, Cl. 72-60.

Ahrons, Richard Wilfred, to RCA Corporation. High gain MOS linear integrated circuit amplifier. 3,678,407, Cl. 330-35.000.

Aisin Seiki Kabushiki Kaisha: *See*—
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Aiuppa, Francesco. Lawn sweeper. 3,676,886, Cl. 15-83.000.

Ajinomoto Co., Inc.: *See*—
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Akers, George J., to Vermont American Corporation. Adjustable squeegee for applying synthetic fillers. 3,676,888, Cl. 15-245.000.

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Albertson, Noel F.; and Wetterau, William F., to Sterling Drug Inc. Process for the preparation of 1,2,3,4,5,6-hexahydro-2,6-methano-3-benzazocines. 3,678,056, Cl. 260-293.520.

Albrecht, Gerd: *See*—
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Alderuccio, Carmelo Leon, to Alderuccio, Lee, & Associates, Inc. Chemical etching solution for printed wiring boards. 3,677,950, Cl. 252-79.500.

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Ali, Mir Akbar; Schwartz, Murray A.; and Li, Pei Ching, to IIT Research Institute. Zinc-lanthanum borate glass composition. 3,677,778, Cl. 106-47.00q.

Alinari, Carlo. Depth gauges. 3,677,087, Cl. 73-300.000.

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Allen, Frances Mignon. Portable bath capsule. 3,677,263, Cl. 128-24.100.

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Allen, Thomas E., to Caterpillar Tractor Co. Stabilizing strut for tracked loader. 3,677,427, Cl. 214-140.000.

Alles, Hirtus E. Self-anchorable composite item and method of making same. 3,677,951, Cl. 250-92.000.

Allied Chemical Corporation: *See*—
Anello, Louis G.; and Sweeney, Richard F., 3,678,068.
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Althouse, Victor E., to Raychem Corporation. Method and means of die matrix expansion. 3,677,875, Cl. 161-117.000.

Altwicker, Elmar R.: *See*—
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Ambac Industries Incorporated: *See*—
Weiss, Paul C., 3,677,540.

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Ambuco Limited Grosvenor House: *See*—
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Ando, Noriyoshi: *See—*
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Andress, Harry J., Jr., to Mobil Oil Corporation. Liquid hydrocarbon compositions containing reaction products of amine derivatives of 1-olefin /maleic anhydride copolymers and methyl vinyl ether-maleic anhydride copolymers as anti-static agents. 3,677,724, Cl. 44-62.
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Anello, Louis G.; and Sweeney, Richard F., to Allied Chemical Corporation. Fluorocarbon acids. 3,678,068, Cl. 260-484.00r.
Anglade, Carlos, Jr. Frame and building structure and method of constructing same. 3,676,964, Cl. 52-86.000.
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Antonenko, Anatoly Ivanovich, to Institut Elektrodinamihi Akademii Nauk Ukrainskoi SSR. Winding of alternating-current electric machine. 3,678,312, Cl. 310-185.000.
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Ariyoshi, Yasuo; Yamatani, Tetsuo; Uchiyama, Noboru; and Sato, Naotake, to Ajinomoto Co., Inc. Method of purifying lower alkyl esters of alpha-L-aspartyl-L-phenylalanine. 3,678,026, Cl. 260-112.500.
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Jeff, William C.; Luyster, Thomas, Jr.; Lynch, James F., Jr.; and Moroli, Frank A., 3,677,794.
Arrigo, Joseph T.; and Christensen, Nils J., to Universal Oil Products Company. Hydrogenation of nitrobenzene. 3,678,108, Cl. 260-563.00d.
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Asahi Glass Co., Ltd.: *See—*
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Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
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Asano, Hidejiro; and Ouyagi, Yashichi, to Nippon Steel Corporation. Method of forming corrosion resistant films on steel plates. 3,677,797, Cl. 117-71.00m.
Asano, Tadao: *See—*
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Ashar, Kanu G., to International Business Machines Corporation. Method of making pedestal transistor having minimal side injection. 3,677,837, Cl. 148-175.000.
Ashbrook, Clifford Logan; and Wing, Wilson Gordon. Muzzle choke. 3,676,947, Cl. 42-79.000.

Aspden, Ronald, to Itek Corporation. Optical surface generating apparatus. 3,676,960, Cl. 51-165.710.

Assenmacher, Peter: *See—*
Herzhoff, Peter; Gref, Hans; Wolfgang, Leverkusen; Frenken, Hans; Assenmacher, Peter; and Westen, Dietmar, 3,677,076.

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Atkinson, Cyril Millward, to Northrop Weaving Machinery Limited. Loom sleys. 3,677,306, Cl. 139-188.000.

Atkinson, Wallace E., to Long Manufacturing Co., Inc. Combination lock construction. 3,677,042, Cl. 70-70.000.

Atomic Energy of Canada Limited: *See—*
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Auergesellschaft GmbH: *See—*
Nather, Claus Siegfried, 3,677,398.

Augl, Joseph M.; Bailey, William J.; and Erickson, Porter W., to United States of America, Navy. Method of rehardening encapsulating compositions. 3,677,787, Cl. 117-2.00r.

Aunstrup, Knud, to Novo Terapeutisk Laboratorium A/S. Preparation of amyloglucosidase. 3,677,902, Cl. 195-66.00r.

Austin, Frank C. Holding tool. 3,676,911, Cl. 29-203.

Austin, George Wesley, to Foseco International Limited. Process of submerged nozzle continuous casting using a basalt flux. 3,677,325, Cl. 164-73.000.

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Cronstedt, Val, 3,677,663.

Avins, Jack, to RCA Corporation. Amplifier-limiter circuit with reduced AM to PM conversion. 3,678,405, Cl. 330-26.000.

Avins, Jack, to RCA Corporation. Variable gain amplifier. 3,678,406, Cl. 330-29.000.

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Ayaki, Kazuo: *See—*
Terazawa, Yoshizumi; and Ayaki, Kazuo, 3,678,317.

Ayres, William M.; and Henry, Ronald A., to United States of America, Navy. Gas generator composition containing a nitrogen rich compound and a catalyst. 3,677,841, Cl. 149-92.000.

Azamber, Eugene C.; and Cabe, Frank D. Battery connector. 3,678,450, Cl. 339-226.000.

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Temple, Hiram E., 3,677,393.

Baldeschwieler, John D., to Varian Associates. Ion cyclotron resonance stimulated glow-discharge method and apparatus for spectral analysis. 3,677,642, Cl. 356-85.000.

Ballou, Clayton R., I/5 to Hursh, Jack E. Shoring structure. 3,676,972, Cl. 52-638.

Ban, Itsuki. Endless magnetic tape cartridge removing apparatus. 3,677,557, Cl. 274-4.00b.

Banner Metals, Inc.: *See—*
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Barabas, Eugene S.; Grosser, Frederick; and Schneider, Louis, to GAF Corporation. Stable aqueous emulsions containing a terpolymer of vinyl alcohol, a vinyl ester and an N-vinyl lactam. 3,677,990, Cl. 260-29.6wb.

Barajas, Joseph W. Brake. 3,677,376, Cl. 188-341.000.

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Schippers, Heinz; Geil, Walter; Albrecht, Gerd; and Jung, Reinhold, 3,677,863.

Barnett, Jackson Herman, Jr. Method for impregnating wood. 3,677,805, Cl. 117-102.00a.

Barnett, Morris A.; and Silver, Alexander, to Garrett Corporation, The. Coated fluid bearing foils and fabricating method. 3,677,612, Cl. 308-5.000.

Barone, Bruno: *See—*
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Barr, David William: *See—*
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Barrineau, Wade H., to Southern Cross Industries, Inc. Merchandise support with hinged shelf. 3,677,203, Cl. 108-111.000.

Barry, Leonard D. Unit load hold-down and mounting. 3,677,194, Cl. 105-368.00b.

Barten, Piet Gerard Joseph, to U.S. Philips Corporation. Plural beam cathode ray tube having boundary-shaped cylindrical electrodes correcting beam aberration. 3,678,316, Cl. 313-69.00c.

Barten, Piet Gerard Joseph, to U.S. Philips Corporation, mesne. Cathode ray tube having triangular gun array and curvilinear spacing between the fourth and fifth grids. 3,678,320, Cl. 313-70.00c.

Bartocci, Antonio, to Olivetti, Ing. C., & C., S.p.A. Terminal equipment for the transmission of data with display and input and output units. 3,678,483, Cl. 340-172.500.

Basic Incorporated: *See—*
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Bass, John C.; and Waterworth, Peter, to Plessey Company Limited, The. Data storage arrangements. 3,678,472, Cl. 340-173.0lt.

Bastiaanse, Abraham G. Liquid treatment method. 3,677,936, Cl. 210-15.000.

Bastian, Jean-Michel: *See—*
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Ebnother, Anton; Bastian, Jean-Michel; and Rissi, Erwin, 3,678,058.

Bateson, Norman E.; and Pringle, William L., to Pullman Incorporated. Cargo handling and transportation system. 3,677,192, Cl. 105-368.00r.

Bathla, Pritam S.; and Simmons, Carl E., to United Aircraft Products, Inc. Remote accumulator charge indicator. 3,677,334, Cl. 165-11.000.

Batscha, Alexander P., to General Electric Company. Composite cycle turbomachinery. 3,677,012, Cl. 60-262.000.

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Bauer, Douglas M., to General Electric Company. Analog digital converter. 3,678,500, Cl. 340-347.0ad.

Bauer, Victor John; Fanshawe, William Joseph; and Wiegand, Gretchen Ellen, to American Cyanamid Company. Certain 4-[(indazol-3-yl)-pyridinium] compounds. 3,678,062, Cl. 260-296.00r.

Bauger, Louis Jules; Beyler, Roland Robert Charles; Le Guen, Henri; Pidebois, Jacques Eloi; and Schenher, Michel Bernard, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Device for burning the unburnt residue in the exhaust gases of internal combustion engines. 3,677,013, Cl. 60-303.000.

Baumgartner, Max. Electromagnetic load compensated weighing apparatus including damping. 3,677,357, Cl. 177-188.000.

Baxter Laboratories Inc.: *See—*
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BDH Pharmaceuticals Limited: *See—*
Beckham, Robinson, 3,677,397.

Beachley, Robert W. Protective automatically disconnectable grouping means for an ungrounded A. C. electrical distribution system. 3,678,338, Cl. 317-18.00r.

Beal, Edward W., to Connecticut International Corporation. Optical system for aircraft guidance light. 3,678,260, Cl. 240-1.200.

Beatrice Food Co.: *See—*
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Beaudry, Harvey James, to International Plasma Corporation. Radio frequency wattmeter. 3,678,381, Cl. 324-95.000.

Beaulieu, Raymond D., to Monsanto Company. Sulfonated phenol-aldehyde resins. 3,677,979, Cl. 260-2.20c.

Beaulieu, Raymond D., to Monsanto Company. Process for making methylolated phenol-sulfonic acid. 3,678,101, Cl. 260-572.00r.

Bechmann, Gerhart, to Leitz, Ernst, G.m.b.H. Lens mount. 3,677,155, Cl. 95-44.00c.

Beck, Merrill G., to Lord Corporation. Axial suspension system that accommodate relative lateral movement. 3,677,535, Cl. 267-63.000.

Becker, Klaus, to Demag Aktiengesellschaft. Syphon lifting device having piston actuated venting valve. 3,677,598, Cl. 294-64.00r.

Beckham, Robinson, to BDH Pharmaceuticals Limited. Package for dosage units. 3,677,397, Cl. 206-42.000.

Beckman Instruments, Inc.: *See—*
Harman, John N., III; and Neti, Radhakrishna M., 3,677,708.

Sawa, Kenneth B.; and Bleak, Thomas M., 3,678,247.
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Beech-Nut Inc.: *See—*
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Beiler, Jay Morton: *See—*
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Belaieff, James Frank, to Frame S.A. Spraying rotor for a dish washing machine or an industrial glass-ware washing machine. 3,677,473, Cl. 239-251.000.
Bell & Howell Company: *See—*
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Gilsdorf, Richard C., 3,678,440.
Johnson, Robert F.; and Lichodziejewski, Wieslaw, 3,677,627.
Bell, Howard F.; and Scheineman, John A., to Shell Oil Company. Pipeline flow tee. 3,677,292, Cl. 137-544.000.
Bell, R. Gordon. Pie and cake saver. 3,677,168, Cl. 99-234.00s.
Bell Telephone Company of Canada, The: *See—*
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Bell Telephone Laboratories, Incorporated: *See—*
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Belogolovin, Nikolai Stefanovich: *See—*
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Bennett, John E.; and O'Leary, Kevin J., to Diamond Shamrock Corporation. Preparation of solid solutions of metallic oxide mixtures by flame-spraying. 3,677,975, Cl. 252-518.000.
Bennett, Moreland P., to General Electric Company. Metallurgical bonding of dissimilar metals. 3,678,242, Cl. 219-118.000.
Bente, Waldama. Fluidized sand trap ejector. 3,677,590, Cl. 291-3.000.
Bentley, David J., Jr.: *See—*
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Berger, James E. Fluid proportioner means. 3,677,296, Cl. 137-606.000.
Bergey, John M.; Le Van, James O.; Walton, Richard S.; and Brethauer, Louis G., to Hamilton Watch Company. Electronic watch. 3,676,993, Cl. 58-23.000.
Bergmeyer, Hans Ulrich; Naher, Gotthilf; Thum, Waldemar; Lauerer, Albert; and Emmer, Rudolf, to Boehringer Mannheim GmbH. Process for the production of glycerokinase. 3,677,901, Cl. 195-66.00r.
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Bickel, David P.; Davis, Melvin H.; Starks, Karl H., Jr.; and Tsoras, John, to Goodyear Tire & Rubber Company, The. Monitoring system. 3,678,486, Cl. 340-227.000.
Bier, Milan. Electroosmotic and electrodialysis concentration, purification, and desalting. 3,677,923, Cl. 204-180.00p.
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Bittner, Donald L. Determination of uricase activity. 3,677,903, Cl. 195-103.50r.

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Reulet, Philippe; Pfister, Alain; Tellier, Jacques; Blanc, Jean-Henry; Jorgensen, Kirsten Borre; and Bohlbro, Hans, 3,678,091.

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Blitz, Daniel, to Sanders Associates, Inc. Fail-safe mechanical timer. 3,677,101, Cl. 74-112.000.

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Bloch, Herman S., to Universal Oil Products Company. Hydrocarbon conversion catalyst and process. 3,678,120, Cl. 260-668.00a.

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Blom, Dirk; Van Overbeek, Adrianus Johannes Wilhelmus Marie; and Zwijsen, Wilhelmus Antonius Joseph Marie, to U.S. Philips Corporation. Linear amplifier circuit. 3,678,404, Cl. 330-22.000.

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Blosch, Walter, to Liss S.A. Method for producing dials. 3,677,793, Cl. 117-38.000.

Blough, Ronald S.; and Curry, Norval, to Fairfield Engineering & Manufacturing Company. Livestock confinement house with improved environmental control. 3,677,229, Cl. 119-16.000.

Blough, Ronald S., to Fairfield Engineering & Manufacturing Company. Livestock drinking device. 3,677,231, Cl. 119-75.000.

Blount, Elmo M.; Snavely, Earl S., Jr.; Messenger, Joseph U.; and Prueger, Nicolas J., to Mobil Oil Corporation. Permafrost completion. 3,677,340, Cl. 166-1.000.

Blowout prevention apparatus for subaqueous drilling: *See—*
Lloyd, Samuel H.; and Santa Fe International Corporation, 3,677,352.

Blum, Julius, Messrs.: *See—*
Rock, Erich, 3,676,898.

Blumenthal, Warren B., to NL Industries, Inc. Polymeric chromium sulfatozirconate compositions, their preparation and use. 3,677,798, Cl. 117-62.100.

Bock, Franz: *See—*
Rottner, Emil; Bock, Franz; Muth, Willi; and Wenzel, Gunter, 3,678,146.

Boehly, Michael A., to Stromberg-Carlson Corporation. Test apparatus for digital repeaters. 3,678,222, Cl. 179-175.31r.

Boehringer Ingelheim G.m.b.H.: *See—*
Weber, Karl-Heinz; Bauer, Adolf; Merz, Herbert; and Minck, Klaus, 3,678,033.

Boehringer Mannheim GmbH: *See—*
Bergmeyer, Hans Ulrich; Naher, Gotthilf; Thum, Waldemar; Lauerer, Albert; and Emmer, Rudolf, 3,677,901.

Boehringer, Wilfred E., to Mc Donnell Douglas Corporation. Trim and damping cylinder. 3,677,488, Cl. 244-103.00r.

Boekhorst, Antonius, to U.S. Philips Corporation. Circuit arrangement for adjusting the linearity of the deflection signal generated for a deflection system. 3,678,332, Cl. 315-27.00r.

Boes, David J., to United States of America, Air Force. Method for preparing metal matrix composites containing modified polytetrafluoroethylene. 3,678,145, Cl. 264-115.000.

Boetto, Charles; and Orkwiszewski, Wayne L., to International Harvester Company. Hydraulic alternator. 3,677,348, Cl. 172-2.000.

Boffa, Gioacchino; Crotti, Argento; Pieri, Giampiero; Mangini, Angelo; and Tundo, Antonio, to Montecatini Edison S.p.A. 6,15 Dialkoxy 5,14 diaza isoviolanthrones. 3,678,053, Cl. 260-272.000.

Boggs, Charles L., to International Paper Company. Laminated board structure and method of making same. 3,677,868, Cl. 161-37.000.

Boggs, Jesse K., to Esso Research and Engineering Company. Tertiary alkylation utilizing an admixture of olefins and tertiary alkyl chlorides. 3,678,123, Cl. 260-671.00r.

Bognaes, Ragnar; and Solberg, Olav, to Kvaerner Brug. Tank construction for liquified and/or compressed gas. 3,677,021, Cl. 62-55.000.

Bohlbro, Hans: *See—*
Reulet, Philippe; Pfister, Alain; Tellier, Jacques; Blanc, Jean-Henry; Jorgensen, Kirsten Borre; and Bohlbro, Hans, 3,678,091.

Bok, Johannes Gerardus, to U.S. Philips Corporation. Camera with piezo-electric crystal flash ignition system. 3,677,153, Cl. 95-11.00r.

Bokros, Jack C.; and Ellis, Willard H., to Gulf Oil Corporation. Method of making a prosthetic device. 3,677,795, Cl. 117-46.0cg.

Bol, Jan; Buttner, Hildegard; and Kuhn, Peter, to Battelle Development Corporation, The. Temperature indicating dispersion filter. 3,677,966, Cl. 252-408.000.

Boliver, Vincent J., to General Electric Company. Vented fuse module for underground power cable system. 3,678,432, Cl. 337-201.000.

Boliver, Vincent J., to General Electric Company. Socket type contact for a fuse holder. 3,678,451, Cl. 339-258.00r.

Bolliand, Robert; and Saligny, Claude, to Societe Rhodiaceta-D.A.P.I.D. Process and apparatus for the production of synthetic textile stuffing material. 3,677,855, Cl. 156-181.000.

Boltrek, Henry; and Kraft, Joseph K., to Westinghouse Electric Corporation. Modular drive unit for a conveyor. 3,677,388, Cl. 198-16.000.

Bond, Donald Spencer, to RCA Corporation. Radio facsimile postal system for multiple addresees. 3,678,180, Cl. 178-5.000.

Bond, William D., to World Industries, Inc. Plural cavity toroidal float pool chemical package. 3,677,711, Cl. 23-267.00a.

Bonk, Joseph S.: *See—*
Dinenno, Philip A., Jr.; Bonk, Joseph S.; Conrad, Kenneth C.; Moore, Rodney S.; Lochman, Harry E.; and Torello, Daniel D., 3,677,658.

Booher, Robert K., to North American Rockwell Corporation. Ratioless and non-inverting logic circuit using field effect boosting devices. 3,678,290, Cl. 307-205.

Boorujy, Salem, to Environmental Sciences, Inc. Tertiary filtering arrangement. 3,677,413, Cl. 210-502.000.

Boothe, Jerry E.; Hoover, Merwin F.; and Schiegg, Dallas L., to Calgon Corporation. Fluorocarbon containing diallylamines. 3,678,110, Cl. 260-567.60m.

Borden Company, The: *See—*
Sandler, Stanley R., 3,677,883.

Borden, George W.; and Trecker, David J., to Union Carbide Corporation. N,N'-(dihydroxy)ethylenebisnorbornenes. 3,678,073, Cl. 260-326.00c.

Bordes, Marcel E. Stabilizing monorail vehicle. 3,677,188, Cl. 104-120.000.

Boreas, Willem J. L., to Weston Instruments Inc. High impact withstanding taut band suspension instrument. 3,678,383, Cl. 324-154.00r.

Boreskov, Georgy Konstantinovich: *See—*
Stepanov, Gennady Arkadievich; Tsailingold, Anatoly Lvovich; Pilipenko, Fedor Semenovich; Sodolev, Valerian Mikhailovich; Boreskov, Georgy Konstantinovich; Buyanov, Roman Alexeevich; and Venyaminov, Sergei Alexeevich, 3,678,124.

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Shemanske, Richard, 3,678,351.
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Borg-Warner Corporation, mesne: *See—*
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Borgstedt, Hans-Ulrich; Ruhle, Manfred; and Wincierz, Peter, to Metallgesellschaft Aktiengesellschaft. Composite material of vanadium alloys and iron or nickel alloys. 3,677,723, Cl. 29-194.000.

Bornstein, Leopold F., to Georgia-Pacific Corporation. Veneer cross binder and laminates prepared therefrom. 3,677,884, Cl. 161-262.000.

Bosch, Robert, Photokino G.m.b.H.: *See—*
Stolzenwald, Ralf J.; and Korner, Peter, 3,677,625.

Bosworth, Delbert B.; and Goodridge, Ernest E., to United Industrial Syndicate, Inc.; d/b/a, Portland Company; division of and United Industrial Syndicate Inc. Carton dispensers having plural cam denesters. 3,677,439, Cl. 221-251.000.

Bott, Ned. Fifth wheel coupler apparatus. 3,677,563, Cl. 280-425.00r.

Boulin, Jacques R.; and Nepomiastchy, Alexis, to Societe Anonyme de Telecommunications. Three-terminal modular electric filters. 3,678,419, Cl. 333-70.00s.

Bower, Jerry Efton: *See—*
Aschkenasy, Herbert; Schuler, John Joseph, Jr.; and Bower, Jerry Efton, 3,677,984.

Bowers, David L., to General Electric Company. Body organ stimulator with interference rejector. 3,677,251, Cl. 128-419.000.

Bowles, Arnold Gordon, to National Forge Company. High production isostatic molding device. 3,677,674, Cl. 425-78.000.

Bowles Fluidics Corporation: *See—*
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Bowles, William R., to Phillips Petroleum Company. Method and apparatus for forming a foundation-leg assembly for and offshore platform. 3,677,113, Cl. 61-46.000.

Boxman, Peter; and Frederik, Johannes van Roessel, to Philips Broadcast Equipment Corporation. Chroma key circuit. 3,678,182, Cl. 178-5.40r.

Boyer, Fred S. Locking devices. 3,677,434, Cl. 220-59.000.

Boyer, Joseph E., to Owens-Illinois, Inc. Apparatus for trimming blown plastic articles. 3,677,454, Cl. 225-99.000.

Bozenhard, Walter Frank: *See—*
Patmore, James R.; Bozenhard, Walter Frank; and Spampanato, Gavino Anthony, 3,678,258.

Bozik, John E.; Swift, Harold E.; and Wu, Ching-Yong, to Ameripol, Inc. Coordination polymerization catalyst. 3,677,968, Cl. 252-431.00n.

Bozik, John E.; Swift, Harold E.; and Wu, Ching Yong, to Ameripol, Inc., mesne. Polymerizing unsaturated monomers with a catalyst of an iron complex, a dialkyl aluminum compound and a bidentate ligand. 3,678,022, Cl. 260-88.700.

Bra-Con Industries, Inc.: *See—*
Marvin, Neil T., 3,677,175.

Brabazon, John J. Knee support. 3,677,265, Cl. 128-80.00c.

Braden, Alvin H. Fish food feeding apparatus. 3,677,230, Cl. 119-51.000.

Brammall, Inc.: *See—*
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Brancaleone, Salvatore T., to International Telephone and Telegraph Corporation. Electrical connector shield. 3,678,445, Cl. 339-143.00r.

Braun, Dieter; and Heinemann, Klaus, to Siemens Aktiengesellschaft. Particle-beam device equipped with magnetic means for transversely displacing parts thereof. 3,678,270, Cl. 250-49.50b.

Brecher, Charles; Pappalardo, Romano; and Samelson, Harold, to GTE Laboratories Incorporated. Liquid laser containing cycloheptatriene. 3,677,959, Cl. 252-301.20r.

Breckenridge, G. J.: *See—*
Kalnin, I. L.; and Breckenridge, G. J., 3,677,804.

Breen, Edward L.: *See—*
Schneider, Marion F.; and Breen, Edward L., 3,678,275.

Breitfuss, Thomas K. Keyed joint arrangement for interconnecting pipe sections. 3,677,581, Cl. 285-292.000.

Bremson Photo Industries, Inc.: *See—*
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Breslow, Jeffrey Dale, to Marvin Glass & Sssociates. Visual and audible signal producing target apparatus. 3,677,545, Cl. 273-102.10c.

Brethauer, Louis G.: *See—*
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Brett, Thomas J., Jr.: *See—*
Mastromatteo, Richard; and Brett, Thomas J., Jr., 3,678,135.

Bretti, Franco, to Olivetti, Ing. C., & C., S.p.A. Automatic writing arrangements for accounting or calculating machines. 3,677,385, Cl. 197-19.000.

Briggs & Stratton Corporation: *See—*
Tharman, Paul A., 3,678,366.

Brindisi, Frank A., Jr.; Nagy, Joseph S.; and Yarkosky, Eugene F., to Enthone, Incorporated. Selectively stripping tin and/or lead from copper substrates. 3,677,949, Cl. 252-79.400.

Briner, William W.: *See—*
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Bristol-Myers Company: *See—*
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British Insulated Callender's Cables Limited: *See—*
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British Titan Products Company Limited: *See—*
Williams, Frank Ronald; Whitehead, Jack; Marshall, Jefferson; Conners, Alan; and Gosden, Derek Vernon, 3,677,740.

Britton, G. B., & Sons Limited: *See—*
Christie, Gerald Anthony; and Doble, Brian Reginald, 3,677,678.
Christie, Gerald Anthony; Doble, Brian Reginald; and Bromfield, Alec Roy, 3,677,679.

Brochard, Claude; and Cossart, Rene, to Creusot-Loire. Positioning the work in a milling lathe. 3,677,114, Cl. 82-2.500.

Brockman, Edwin. Toothbrush. 3,677,264, Cl. 128-62.00a.

Brode, George L., to Union Carbide Corporation. Vulcanized silicon terminated polymers. 3,678,010, Cl. 260-75.00t.

Bromfield, Alec Roy: *See—*
Christie, Gerald Anthony; Doble, Brian Reginald; and Bromfield, Alec Roy, 3,677,679.

Bronstein, Benjamin. Pick-up load holder. 3,677,562, Cl. 280-179.00a.

Brooker, Leslie G. S.: *See—*
Van Lare, Earl J.; and Brooker, Leslie G. S., 3,678,045.

Brooks, Robert E., to Ranco Incorporated. Temperature sensing device for room air tempering apparatus. 3,678,434, Cl. 338-196.000.

Brorson, Donald L.; and Magnuson, Raymond A., to Beatrice Food Co. Mounting arrangement for pivotal space divider. 3,677,322, Cl. 160-135.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Iwashima, Hideo; and Fukao, Satoshi, 3,678,424.

Brotherton, Thomas K.; Lynn, John W.; and Knopf, Robert J., to Union Carbide Corporation. Polyurethane products. 3,677,983, Cl. 260-2.5at.

Brown, Alexander M., to Sherwood Medical Industries Inc. Needle cap for syringe package. 3,677,247, Cl. 128-221.000.

Brown, Arthur K., Jr., to Bendix Corporation, The. Hydraulic booster with safety device. 3,677,140, Cl. 91-391.000.

Brown, Boveri & Company, Ltd.: *See—*
Mottier, Francois; and Wild, Peter J., 3,678,399.

Brown, Buck C., to Control Concepts Corporation. Vertical locking circuit. 3,678,199, Cl. 178-69.5tv.

Brown, Carl W.; Reppert, Allen B.; and Dobbins, Billy D., to United States of America, Navy. Scanning interferometer-beam rider guidance system. 3,677,500, Cl. 244-3.130.

Brown, Dale G.: *See—*
Hill, Ira D.; Mikherjee, Barid B.; and Brown, Dale G., 3,678,172.

Brown, Dale H., to General Electric Company. Combined steam power plant and water distillation system. 3,677,905, Cl. 202-172.000.

Brown, Gaylord W., to Koehring Company. Plastics thermoforming machine. 3,677,675, Cl. 425-107.000.

Brown, Henry; and Tomaszewski, Thaddeus W., to Udylite Corporation, The. Codeposition of a metal and fluorocarbon resin particles. 3,677,907, Cl. 204-16.000.

Brown, John Colin; and Cheer, Roy Anthony, to Ilford Limited. Development process. 3,677,761, Cl. 96-66.500.

Brown, Robert M.: *See—*
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Brown, Robert M., to Brown, Robert M. and Computech, Inc. Marine speedometer and anemometer with digital readout. 3,678,474, Cl. 340-173.00r.

Brown, Terry D.: *See—*
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Browning Arms Company: *See—*
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Browning, William C.; Perricone, Alphonse C.; and Elting, Katherine Anne C., to Milchem Incorporated. Galactomannan composition and treatment for the prevention of thixotropy destruction of same by ligands. 3,677,961, Cl. 252-316.000.

Brucker, William S., to Black and Decker Manufacturing Company, The. Chuck guard. 3,677,657, Cl. 408-241.00g.

Bruner, Peter Martin, to AMP Incorporated. Assembly and test device for microelectronic circuit members. 3,678,385, Cl. 324-158.00f.

Brunkhardt, Frederick W.: *See—*
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Bryk, Petri; Haani, Martti; Honkasalo, Jorma B.; Kinnunen, Jorma; Lindsjo, Olle; Nyholm, Erik; Poijarvi, Jaakko; Rastas, Jussi; and Kangas, Juhani, to Outokumpu Oy. Process for removal and recovery of mercury from gases. 3,677,696, Cl. 23-2.

Bucek, Jiri B.; and Shultz, James R., to Fincor, Inc. Control for three phase A. C. motor. 3,678,355, Cl. 318-203.00r.

Buchanan, Alan D., to Monsanto Australia Limited. Production of para-substituted phenol/formaldehyde resins. 3,677,986, Cl. 260-29.300.

Bucher-Guyer AG Maschinenfabrik: *See—*
Hauser-Lienhard, Hans Ulrich, 3,676,988.

Buck, Eugene W. Radial positioner, lock and rotary contacts for electromagnetic drill mount. 3,677,656, Cl. 408-76.000.

Buckeye Cellulose Corporation, The: *See—*
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Buerger, Herbert. Process for making a wheel trim lock ring assembly. 3,676,919, Cl. 29-469.000.

Bugaut, Andree: *See—*
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Bump, Thomas R.: *See—*
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Bungardt, Karl; Lehnert, Gunter; and Meinhardt, Helmut W., to Deutsche Edelstahlwerke Aktiengesellschaft. Protective diffusion layer on nickel and/or cobalt-based alloys. 3,677,789, Cl. 117-22.000.

Bunker-Ramo Corporation, The: *See—*
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Burkhardt, Joseph A.: *See—*
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Burland, Oliver John. Supporting bar assembly for vehicle. 3,677,451, Cl. 224-47.10f.

Burnett, Richard T.: *See—*
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Burnett, Richard T., to Bendix Corporation, The. Disc brake mounting means. 3,677,372, Cl. 188-73.300.

Burns, Erwin; and Stevenson, Alan D. Hanger and packer well tool. 3,677,341, Cl. 166-124.000.

Burridge, Robert E.: *See—*
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Burroughs Corporation: *See—*
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Wallace, Harry L., 3,677,452.
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Burwen, Richard S. Dynamic noise filter having means for varying cutoff point. 3,678,416, Cl. 333-17.000.

Burzan, Vernon J.: *See—*

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Burzan, Vernon J., to KMS Industries, Inc. Identification card locator assembly. 3,677,639, Cl. 355-76.000.

Bush, Donald M., to United States of America, Atomic Energy Commission. Thermal battery having a thermal reservoir pellet. 3,677,822, Cl. 136-83.005.

Bush, Richard Paul; and Thomas, Bryan, to Dow Corning Limited. Organosilicon compounds containing silazane and siloxane linkages. 3,677,977, Cl. 260-47.00r.

Bushey, Donald F., to United States of America, Army. Extractor for primer cartridge cases. 3,677,133, Cl. 89-27.00b.

Busler, William R., to Phillips Petroleum Company. Lactone polymerization with a dicarboxylic acid-water initiator. 3,678,069, Cl. 260-484.00a.

Butler Manufacturing Company: *See—*
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Buttner, Hildegard: *See—*
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Buyanov, Roman Alexeevich: *See—*
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Buys, Pieter, to Applied Power Industries, Inc. Hydraulic jack. 3,677,518, Cl. 254-93.00r.

Buzova, Zoya Mikhailovna: *See—*
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Buzzi, Umberto; Dufresne, Jacques Pierre; and Farfaletti-Casali, Flaviano, to European Atomic Energy Community (Euraton). Apparatus for charging and discharging fuel elements in a vertical-channel nuclear reactor. 3,677,328, Cl. 165-47.000.

Byers, Thomas W.: *See—*
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Byron, John W., to Phillips Petroleum Company. Production of carbon black. 3,677,704, Cl. 23-209.400.

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Caiola, Leonard, to Information Utilization Corporation. Analysis of radioactive slide specimen and method of preparation. 3,678,148, Cl. 424-1.000.

Calgon Corporation: *See—*
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Campbell, Henry Fred, to Campbell Research Corporation. Stressed concrete structures and method of making. 3,676,968, Cl. 52-223.000.

Campbell, James K.; and Lee, Kenneth M., to Dow Corning Corporation. Silicone-acyrlate soil release treatment for organic textiles. 3,677,810, Cl. 117-138.80f.

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Carlson, Arthur W., to Velsicol Chemical Corporation. Process for preparing a methano-poly-cyclic hydroquinone. 3,678,116, Cl. 260-619.00f.

Carlson, John David, to Koppers Company, Inc. Integrated insulated and weatherproof roof system. 3,677,878, Cl. 161-160.000.

Carlson, Ronald H., to Hooker Chemical Corporation. Synergistic metal sequestrant. 3,677,956, Cl. 252-180.000.

Carrier Corporation: *See—*
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Carroll, Robert L.; and Hayward, Charles R., to Swift Agricultural Chemicals Corporation, mesne. Production of fertilizer from wet phosphoric acid. 3,677,734, Cl. 71-34.

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Carter, Alastair Howroyd. Discoidal electric motor. 3,678,314, Cl. 310-268.000.

Cartridge Television, Inc.: *See—*
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Cartwright, John Sutton; and Fuchs, Francis Joseph, Jr., to Western Electric Company, Incorporated. Method of and apparatus for positive fluid flow extrusion. 3,677,049, Cl. 72-60.

Carty, Edward J.; and McDowell, Francis C., to General Electric Company. Fibrous glass filled polycarbonate resins. 3,678,079, Cl. 260-37.0pc.

Cary, John T.: *See—*
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Casebier, Ronald L.; Herrick, Franklin W.; Gray, Kenneth R.; and Johnston, Frederic A., to International Telephone and Telegraph Corporation. Processes for preparing mannose and mannose derivatives. 3,677,818, Cl. 127-46.00r.

Cash, John H., Jr.; and Cunningham, James A., to Texas Instruments, Incorporated. RG sputtering method. 3,677,924, Cl. 204-192.000.

Casper, Robert P., to Hughes Aircraft Company. Opto-electronic scene monitoring system. 3,678,492, Cl. 340-258.00b.

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Cathey, Le Conte, to United States of America, Atomic Energy Commission. Thermoelectric generator. 3,677,825, Cl. 136-202.000.

Caule, Elmer J., to Olin Corporation. Tarnish resistant copper and copper alloys. 3,677,828, Cl. 148-6.15r.

Celanese Coatings Company: *See—*
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Centre Electronique Horloger SA: *See—*
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Cerberus AG: *See—*
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Chamberlain, William H.: *See—*
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Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., to Delta Design, Inc. Integrated circuit handling system. 3,677,401, Cl. 209-73.000.

Charles River Foundation, The: *See—*
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Charron, Jean. Camper trailer. 3,677,600, Cl. 296-27.000.

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Scherban, Alexandr Nazarievich; Furman, Neonil Izrailevich; Sotnichenko, Boris Feodosievich; Belogolovin, Nikolai Stefanovich; Chopovsky, Jury Ivanovich; Sutormin, Jury Nikolaevich; Zaitsev, Valentin Ivanovich; Kot, Vladimir Ivanovich; Mikhailjuk, Nikolai Tarasovich; Denisenko, Sergei Andreevich; Chaschinov, Anatoly Vasilievich; Shaporev, Stepan Vasilievich; and Samoilenko, Svetlana Mikhailovna, 3,678,489.

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Chung, Daniel A.; and Pearson, Charles J., to Goodyear Tire & Rubber Company, The. Polyureaurethane shock absorbing compositions. 3,677,869, Cl. 161-42.000.
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Clark, Harold A. Method for application of pressure-sensitive adhesives. 3,677,859, Cl. 156-250.000.
Clark, James M., to International Telephone and Telegraph Corporation. Frame synchronization system. 3,678,200, Cl. 178-69.50r.
Clark, Joseph Edwin. Drilling and degasser. 3,676,984, Cl. 55-193.000.
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Clarkson, Frank Henry, to Clarkson International Tools Limited. Chuck having means to axially position tool. 3,677,560, Cl. 279-47.000.
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Clippingdale, John Walter; and Watson, Charles Andrew, to Lever Brothers Company. Toothpastes. 3,678,155, Cl. 424-52.000.
Coates, Vincent J.; and Welter, Leonard M., to American Optical Corporation. Field emission electron gun utilizing means for protecting the field emission tip fom high voltage discharges. 3,678,333, Cl. 315-31.000.
Coberley, Daniel A.: *See—*
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Coccagna, Daniel T.; and Eldamati, Salah Eldin A. Pallet. 3,677,200, Cl. 108-58.000.
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Cohen, Gerald; and Crystal, Maurice I., to Sylvania Electric Products Inc. Modular switching network. 3,678,205, Cl. 179-15.0aq.
Cohrs, Arthur H.; and Kresse, Franklin T. Tree excavating machine. 3,676,941, Cl. 37-2.00r.
Cole, John M.; and Sinclair, William, to Thomas & Betts Corporation. Method of fabricating a magnetic memory matrix. 3,676,924, Cl. 29-604.000.
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Collins, David R. Corner construction for aquarium or the like. 3,677,433, Cl. 220-4.00r.
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Connor, Augustus S., to Wix Corporation. Oil filter and seal means therefor. 3,677,412, Cl. 210-440.000.

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Conrad, Kenneth C.: *See—*
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Cook, Charles R., Jr., to International Telephone and Telegraph Corporation. Method of fabricating a semiconductor device. 3,676,922, Cl. 29-577.000.

Cook, William H., to Bunker-Ramo Corporation, The. Automatic photo comparison system. 3,678,190, Cl. 178-6.800.

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Copeland, John Alexander, III, to Bell Telephone Laboratories, Incorporated. Stacking arrangement which provides self-biasing for single wall domain organizations. 3,678,478, Cl. 340-174.0tf.

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Coppel, Georges, to Constructions Mills-K. Flexible bearing for a conveyor roller capable of being incorporated in a rolling plane. 3,677,382, Cl. 193-35.00b.

Copper Range Company: *See—*
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Coppola, Mario. Device for the automatic molding of paste-like, solidifiable products, such as, for instance, cosmetics and the like. 3,677,677, Cl. 425-109.000.

Coran, Aubert Y.; and Vineyard, Billy D., to Monsanto Company. Monosubstituted ureas as fuel additives. 3,677,726, Cl. 44-71.000.

Corey, Victor B., to Sundstrand Data Control, Inc. Measuring system for a fluid flow stream. 3,677,086, Cl. 73-205.00r.

Cork, Gordon H.; Tenniswood, David M.; and Kaptur, Robert E., to Gemco Electric Company. Machine control. 3,677,099, Cl. 74-89.200.

Corkill, John L., to Husky Oil Ltd. Submersible pump assembly. 3,677,665, Cl. 417-410.000.

Corless, Lee M., to B & J Manufacturing Company, mesne. Tire bead seating and inflation apparatus and method for using same. 3,677,320, Cl. 157-1.100.

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Coulter Electronics, Inc.: *See—*
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Cox, Clifford B. Remote control door lock. 3,677,043, Cl. 70-92.000.

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CPC International Inc.: *See—*
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Crickmer, Charles D. Well swab. 3,677,143, Cl. 92-241.000.

Crivello, James V., to General Electric Company. Oxidation of hydroxylated aromatic compositions. 3,678,080, Cl. 260-396.00r.

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Croce, Louis J.; and Barone, Bruno, to Petro-Tex Chemical Corporation. Promotion of liquid phase oxidation catalysts. 3,678,105, Cl. 260-524.

Cronkhite, Leonard W., Jr.: *See—*
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Cronstedt, Val, to Avco Corporation. Multilayer ring damped turbomachine rotor assembly. 3,677,662, Cl. 416-183.000.

Cronstedt, Val, to Avco Corporation. Damped turbomachine rotor assembly. 3,677,663, Cl. 416-183.000.

Cross, Fred H.; and Deradoorian, Bagdasar, to Bendix Corporation, The. Channel multiplier assembly and method of manufacture thereof. 3,678,328, Cl. 315-12.000.

Cross, Norton M., Jr.: *See—*
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Cutter, James W. Material cutting apparatus with reciprocating cutting elements. 3,677,117, Cl. 83-150.

Cutting, Arch E.; Owens, Carlos L.; Williams, Dewey H.; and Hooper, Felix E., to Southern Machinery Company. Loom having interconnected warp let-off and cloth take-up means at back of loom. 3,677,305, Cl. 139-99.000.

Cutting Room Appliances Corp.: *See—*
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Cyr, Lawrence. Means for adjusting heights of cut in power mower. 3,677,574, Cl. 280-43.130.

Czerniejewski, Conrad P.: *See—*
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Czirely, Julius. Contraceptive device. 3,677,225, Cl. 128-132.000.

Dahle, Norman A., to Gulf Research & Development Company. Combating unwanted vegetation with 2-(2',5'- dimethyl-pyrrolidinyl)-5-aryl-1,3,4-thiadiazoles. 3,677,737, Cl. 71-90.000.

Daly, John L. Baseboard molding incorporating cover sections for concealing electrical wall outlet receptacles. 3,676,974, Cl. 52-716.

Dalziel, Warren L.; Nilson, Jay B.; and Wartner, Donald L., to International Business Machines Corporation. Data storage apparatus employing a single magnetic disk. 3,678,481, Cl. 340-174.10c.

Damon Corporation: *See—*
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Dan, Carlo; and Pinkham, James F., to Multra-Guard, Inc. Security alarm system. 3,678,509, Cl. 340-409.000.

Dancy, William B., to International Minerals & Chemical Corporation. Beneficiation of clay-containing sylvinite ore. 3,677,475, Cl. 241-20.000.

D'Andrea, Guiliano, to United States of America, Army. Thermally conductive bearing material. 3,677,879, Cl. 161-170.000.

Danielson, Gunnar H., to Valley Craft Products, Inc. Drum pallet. 3,677,436, Cl. 220-97.00b.

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DaSilva, Miguel. Lock with key activating alarm mechanism. 3,677,219, Cl. 116-80.000.

Data Packaging Corporation: *See—*
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Data Printer Corporation: *See—*
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Davidson, James P.: *See—*
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Davis, Dennis J.; Sudnick, Dennis J.; Juhasz, John E.; and Kurichh, Sham, to Bendix Corporation, The. Adaptive control for fluid pressure braking system. 3,677,609, Cl. 303-21.0be.

Davis, Hazel E. Lipstick dispenser. 3,677,654, Cl. 401-63.000.

Davis, James A. Receptacle for dispensing rollable pill containers. 3,677,440, Cl. 221-279.000.

Davis, James G., to United States of America, Air Force. Transparent fluid sampler permitting particulate analysis in an assembled condition. 3,677,065, Cl. 73-28.000.

Davis, John Christopher Hammond, to Plessey Telecommunications Research Limited; k/a and Plessey BTR Limited. Gyroscope uncaging device. 3,677,098, Cl. 74-5.120.

Davis, Melvin H.: *See—*
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Davis, Paul, to Sweetheart Plastics, Inc. Container. 3,677,435, Cl. 220-60.00r.

Davis, Walter Dennis, to Associated Lead Manufacturers Limited. Cell for electrolytic refining of metals. 3,677,926, Cl. 204-243.00r.

Day, Christopher C., to American Optical Corporation. Impedance pneumograph. 3,677,261, Cl. 128-2.10z.

Day, Christopher C., to American Optical Corporation. Electrical signal slope polarity change detector. 3,678,296, Cl. 307-231.000.

Day, Christopher C., to American Optical Corporation. Instrument power-disconnect alarm. 3,678,491, Cl. 340-253.00c.

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De Boer, Charles D.; and Luckey, George W., to Eastman Kodak Company. Pigmented photosensitive polymer system. 3,677,763, Cl. 96-82.000.

De Brebisson, Michel, to U.S. Philips Corporation. Method of manufacturing a zener diode. 3,677,838, Cl. 148-187.000.

De Frees, Paul T. Keycase. 3,677,044, Cl. 70-456.00r.

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De Jager, Evert; and Homan, Jan Daniel Herman, to Organon Inc. Adsorption complexes of peptides having acrenocorticotropic hormone activity. 3,678,027, Cl. 260-112.500.

de Kock, Arie Jan Rudolf: *See—*
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De Valenzuela, Ricardo Barredo. System of fixing braided cables and rods subjected to stress. 3,676,900, Cl. 24-126.00l.

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Deere and Company: *See—*
Roth, Wolfgang, 3,677,142.

Deike, Robert F., 1/4 to Chamberlain, William H. and 1/4 to Chamberlain, Anna B. Pole or post mounting for ground anchor. 3,676,965, Cl. 52-98.000.

Dekhar, Inc.: *See—*
Wahlberg, Edward John, 3,677,593.

Del Electronics Corporation: *See—*
Constable, James M., 3,678,341.

Delaney Gallay Limited: *See—*
McGuire, Kenneth John, 3,677,870.

Dell John D.: *See—*
Perrin, Alfred .; Dell John D.; Evans, David B.; and Lewis, George Stanley, 3,677,339.

Delonge, Jean Georges. Plant box. 3,676,953, Cl. 47-38.100.

Delpino, Frank H. Analog entry data card for game scoring, or the like, and method of using the same. 3,678,251, Cl. 235-61.11a.

Delta Design, Inc.: *See—*
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., 3,677,401.

Demag Aktiengesellschaft: *See—*
Becker, Klaus, 3,677,598.

Dence, Donald S., to Clark Equipment Company. Hydraulic shifting mechanism for a mechanical transmission. 3,677,105, Cl. 74-477.000.

Denisenko, Sergei Andreevich: *See—*
Scherban, Alexandr Nazarievich; Furman, Neonil Izrailevich; Sotnichenko, Boris Feodosievich; Belogolovin, Nikolai Stefanovich; Chopovsky, Jury Ivanovich; Sutormin, Jury Nikolaevich; Zaitsev, Valentin Ivanovich; Kot, Vladimir Ivanovich; Mikhailjuk, Nikolai Tarasovich; Denisenko, Sergei Andreevich; Chaschinov, Anatoly Vasilievich; Shaporev, Stepan Vasilievich; and Samoilenko, Svetlana Mikhailovna, 3,678,489.

Denk, Hans; and Habrich, Reiner, to Siemens Aktiengesellschaft. Flame-resistant cast resin molding materials, particularly for the production of non-combustible electrical components. 3,677,999, Cl. 260-38.000.

Denning, Ralph Murch, to Rolls-Royce Limited. Jet propulsion power plant. 3,677,501, Cl. 244-12.00b.

Dennis, Kent S.: *See—*
Zimmerman, Robert L.; Dennis, Kent S.; and Moore, Eugene R., 3,678,016.

Deradoorian, Bagdasar: *See—*
Cross, Fred H.; and Deradoorian, Bagdasar, 3,678,328.

Deradoorian, Bagdasar; Goodrich, George W.; and Theodorou, Dimitri G., to Bendix Corporation, The. Method of fabricating an array of channel multipliers. 3,677,730, Cl. 65-36.000.

deStevens, George: *See—*
Gschwend, Heinz Werner; and deStevens, George, 3,678,059.

Dethloff, Jurgen; and Grottrup, Helmut, to Intelectron Patentverwaltung GmbH. Identification switch. 3,678,250, Cl. 235-61.11r.

Deutsche Edelstahlwerke Aktiengesellschaft: *See—*
Bungardt, Karl; Lehnert, Gunter; and Meinhardt, Helmut W., 3,677,789.

Devine, Edward, to Security Systems, Inc. Elevator alarm system. 3,677,370, Cl. 187-37.000.

Dexter Corporation, The: *See—*
Klapprott, David K.; and Paradis, Daniel L., 3,678,130.
Klapprott, David K.; and Paradis, Daniel L., 3,678,131.

Dexter, Martin; Spivack, John Denon; and Steinberg, David Herbert, to Geigy Chemical Corporation. Alkylhydroxyphenyl polyamides as antioxidants. 3,677,965, Cl. 252-403.000.

Dexter, Martin; and Spivack, John Denon, to Geigy Chemical Corporation. Substituted derivatives of malonic acid useful as stabilizers. 3,678,095, Cl. 260-473.00s.

Diamond Shamrock Corporation: *See—*
Bennett, John E.; and O'Leary, Kevin J., 3,677,975.
Lichtman, Irwin A.; and Rosengart, Abraham M., 3,677,963.

Dicke, Clarence C., to Dicke Tool Company. Portable folding warning sign standard. 3,677,511, Cl. 248-448.000.

Dicke Tool Company: *See—*
Dicke, Clarence C., 3,677,511.

Dickey, W. S., Clay Manufacturing Company: *See—*
Siegfried, Edward C.; Harwell, Conner J.; and Murphy, Shields, 3,677,687.

Diener, Rudolf, to Autoelektronik AG. Thyristor circuit arrangement, especially for periodically switching-in and switching-out a load. 3,677,254, Cl. 123-148.00e.

Diener, Rudolf, to Autoelektronik AG. Transistor circuit arrangement for supplying a load with work pulses of constant current intensity. 3,678,299, Cl. 307-275.000.

Dierks, James E., to Eastman Kodak Company. Camera. 3,677,152, Cl. 95-11.00r.

Dietrick, Gerald P. Fluid handling system for electrical discharge machining equipment. 3,678,240, Cl. 219-69.00d.

Dietz, Walter A.: *See—*
King, William H., Jr.; and Dietz, Walter A., 3,677,066.

Digges, Kennerly H., to United States of America, Air Force. Heat removal system for brakes. 3,677,360, Cl. 180-124.000.

Digital Information Devices, Inc.: *See—*
Lowry, Alan B.; Mathus, Gregory; and Staciokas, Leon, 3,677,497.

Dillard, Paul A.; and Baker, Donald R., to TRW Inc. Folding depolyable panel structure having roll-up retaining spring for stowage. 3,677,508, Cl. 244-155.000.

Dillenburger, Wolfgang, to Fernseh GmbH. Smearing effect attenuation. 3,678,195, Cl. 178-7.200.

Dilling, George R., to Barber-Colman Company. Guide for unwinding thread from a package. 3,677,489, Cl. 242-129.720.

Dinenno, Philip A., Jr.; Bonk, Joseph S.; Conrad, Kenneth C.; Moore, Rodney S.; Lochman, Harry E.; and Torello, Daniel D., to Westinghouse Electric Corporation. Split casting steam chest, nozzle chamber and casing assembly for turbines. 3,677,658, Cl. 415-108.000.

Dinizo, Philip T., Jr. Swimming pool water purifier. 3,677,408, Cl. 210-169.000.

Dinsmore, D. J., Co.: *See—*
Taylor, Henry A.; and Sterner, Maurice E., Jr., 3,676,956.

Dittmann, Walter: *See—*
Riemhofer, Franz; Dittmann, Walter; Biethan, Uwe; Hornung, Karl-Heinz; and Schultze, Ernst-Christian, 3,678,128.

Dixon, Thomas P.; and Worrell, Robert J., to United Aircraft Corporation. Fluid pressure variation sensor and indicator. 3,677,218, Cl. 116-70.000.

Dobbins, Billy D.: *See—*
Brown, Carl W.; Reppert, Allen B.; and Dobbins, Billy D., 3,677,500.

Doble, Brian Reginald: *See—*
Christie, Gerald Anthony; and Doble, Brian Reginald, 3,677,678.
Christie, Gerald Anthony; Doble, Brian Reginald; and Bromfield, Alec Roy, 3,677,679.

Dobler, Christian D.; and Lilly, Herbert J., Jr., to Subsea Equipment Associates Limited, mesne. Method for connection of an underwater riser to a floating facility. 3,677,310, Cl. 141-1.

Dobo, Janos; Somogyi, Agnes; and Lakner, Endre, to Medimpex Gyogyszerkulkereskedelmi Vallalat. Dose indicator paint of an aqueous emulsion of vinyl chloride copolymer and methanyl yellow. 3,677,967, Cl. 252-408.000.

Dokoupil, Jiri, to Maschinenfabrik Turner A.G. Apparatus for working flat, flexible material. 3,677,041, Cl. 69-33.000.

Dombroski, Edward L. Tile structure with cruciform shaped foundation supporting tiles. 3,676,971, Cl. 52-603.000.

Doner, John T., to Whirlpool Corporation. Removable door structure. 3,677,259, Cl. 126-194.000.

Dora, Ralph A.: *See—*
Graff, Jack; and Dora, Ralph A., 3,677,706.

Doris, Thomas A., Jr., to United States of America, Army. Low light level tracer mix. 3,677,842, Cl. 149-109.00.

Dornan, John R., to Corning Glass Works. Molten galss shears. 3,677,732, Cl. 65-133.000.

Dorsch, Johannes. Method and apparatus for the measurement of dye dilution in blood. 3,677,648, Cl. 356-40.000.

Douglas, David. Beverage container. 3,677,524, Cl. 259-72.000.

Dow Chemical Company, The: *See—*
Birrell, George B., 3,678,025.
Hargash, Paul, 3,677,522.
Lindy, Lowell B., 3,677,952.
Liu, Gordon Y. T.; and Strange, Carl P., 3,678,024.
Moore, Carl, 3,677,991.
Pence, Samuel A., Jr., 3,677,987.
Seiber, James N.; and Stringham, Robert R., 3,677,916.
Setser, Donald D., 3,678,494.
Stout, Caleb M.; Nimerick, Kenneth H.; and Parks, Christ F., 3,677,014.
Sun, Yun-Chung, 3,677,023.
Zimmerman, Robert L.; Dennis, Kent S.; and Moore, Eugene R., 3,678,016.

Dow Corning Corporation: *See—*
Antonen, Robert C., 3,677,872.
Campbell, James K.; and Lee, Kenneth M., 3,677,810.
Gansheimer, Josef; and Schanzer, Oswald, 3,677,946.
Metevia, Virgil L.; Narlock, Raymond M.; and Mast, Milfred E., 3,677,877.
Saam, John C.; and Fearon, Frederick W. G., 3,678,125.
Saam, John C.; and Fearon, Frederick W. G., 3,678,126.
Young, Donald G., 3,677,998.

Dow Corning Limited: *See—*
Bush, Richard Paul; and Thomas, Bryan, 3,677,977.

Dowbenko, Rostyslaw; Chang, Wen-Hsuan; and Anderson, Carl C., to PPG Industries, Inc. Metal salt complexes of imidazoles as curing agents for one-part epoxy resins. 3,677,978, Cl. 260-2.0ep.

Dowbenko, Rostyslaw; and Anderson, Carl C., to PPG Industries, Inc. Metal salt complexes of imidazolium salts as curing agents for one part epoxy resins. 3,678,007, Cl. 260-47.0en.

Dowdy, David A.: *See—*
Abbott, Malcolm K.; and Dowdy, David A., 3,677,118.

Dragoo, Sherman L., to Corrugated Finishing Products, Inc. Method for producing cutting rules. 3,677,111, Cl. 76-101.00r.

Dresser Industries, Inc.: *See—*
Cope, Geoffrey W.; and Skinner, George C., 3,678,442.

Drohmann, Carl, Gesellschaft mit beschrankter Haftung: *See—*
Engelhardt, Walter; and Bernhardt, Bruno Friedrich, 3,676,980.

Druet, Charles F. Device for the preparation of mixtures of liquids in pre-determined proportions and quantities. 3,676,932, Cl. 33-126.70a.

Dryden, Hugh L., Jr., to Searle, G. D., & Co. Esterification of 17-hydroxy steroids. 3,678,082, Cl. 260-397.500.

Du Pont de Nemours, E. I., and Company: *See—*
Adams, Philip E.; and Fearnow, Philip W, 3,678,140.
Blackwell, John; and Tropea, Alfred, 3,678,028.
Irsay, Robert D., 3,678,170.
Knowles, Richard N., 3,677,802.
Knowles, Richard N., 3,678,109.
Knowles, Richard N., 3,678,171.
McClellan, William R.; and Stiles, Alvin B., 3,678,139.
Middleton, William J., 3,678,117.

Du Pont of Canada Limited: *See—*
Fairfield, Hugh J., 3,676,991.

Dubach, Paul. Process for permanently crimping yarn and the like. 3,678,142, Cl. 264-25.

Dubeck, Michael; and Shubkin, Ronald L., to Ethyl Corporation. Preparation of carboxylic acids. 3,678,083, Cl. 260-413.

Dudko, Daniil Andreevich: *See—*
Maximovich, Boleslav Ivanovich; Dudko, Daniil Andreevich; Agafonov, Nikolai Georgievich; Maximov, Igor Petrovich; Andreev, Vadim Grigorievich; Lepilov, Nikolai Yakovlevich; Svinov, Alexei Kapitonovich; Slonimsky, Alexandr Borisovich; Volk, Boris Zakharovich; Gubin, Alexandr Ivanovich; and Katsman, Berta Osipovna, 3,677,330.

Dufresne, Jacques Pierre: *See—*
Buzzi, Umberto; Dufresne, Jacques Pierre; and Farfaletti-Casali, Flaviano, 3,677,328.

Dufton, John Peter: *See—*
Panter, Robert B.; Dufton, John Peter; Duthie, Robert W.; and Verbaas, George, 3,678,197.

Dugdale, Ronald Arthur; Ford, Stanley Denis; and Maskrey, John Thomas, to United Kingdom Atomic Energy Authority. Non-thermionic glow discharge devices. 3,678,334, Cl. 315-111.000.

Dunlop Holdings Limited: *See—*
King, Colin F., 3,677,300.

Dunn, William J.: *See—*
Block, Leonard A.; and Dunn, William J., 3,677,416.

Dupieux, Jacques Georges; Gadre, Jean-Claude; Le Corre, Jean-Pierre; deceased (by La Corre, Yvette Marie Laurence; administratrix); and Loisel, Jean Francois Pierre Julien, to International Standard Electric Corporation. TDM switching network using time spaced control signals. 3,678,206, Cl. 179-18.00j.

Duprey, Richard H., to Interroyal Corporation. Bed locking device. 3,676,881, Cl. 5-63.000.

Dusza, John Paul: *See—*
Joseph, Joseph Peter; Dusza, John Paul; and Bernstein, Seymour, 3,678,029.

Duthie, Robert W.: *See—*
Panter, Robert B.; Dufton, John Peter; Duthie, Robert W.; and Verbaas, George, 3,678,197.

Dutkewych, Oleh Borys: *See—*
Shipley, Charles Raymond; Gulla, Michael; and Dutkewych, Oleh Borys, 3,677,776.

Dutkiewicz, Bronislaw K., to Stone & Webster Engineering Corporation. Heating apparatus and process. 3,677,234, Cl. 122-240.00a.

Dyer, George A., to North American Rockwell Corporation. Two-step magnetic driver. 3,678,298, Cl. 307-270.000.

Dyer, Robert F., to Hoover Company, The. Suction cleaner. 3,676,890, Cl. 15-339.000.

Dynamic Corporation of America: *See—*
Swanke, Roy L.; and Raymond, Gordon H., 3,678,357.

Dynamic Precision Controls Corporation: *See—*
Van Ostrand, William F., 3,678,356.

Dynamics Corporation of America: *See—*
Swanke, Roy L.; and Raymond, Gordon H., 3,678,288.

Eads, Harold L.: *See—*
Robison, James W.; and Eads, Harold L., 3,676,930.

Earing, Mason H., to General Electric Company. Epoxy resin cement. 3,677,995, Cl. 260-37.0ep.

Eastern Products Corporation: *See—*
Roles, David Jack, 3,677,589.

Eastman Kodak Company: *See—*
Bishop, John F.; Hunter, Walker F., Jr.; and Rowley, Martin E., 3,677,790.
De Boer, Charles D.; and Luckey, George W., 3,677,763.
Dierks, James E., 3,677,152.
Ettischer, Helmut, 3,677,156.
Ford, John A., Jr.; McConkey, Robert C.; and Laakso, Thomas M., 3,677,754.
Harned, William L., 3,677,476.
Harvey, Donald M., 3,677,160.
Inglis, George M., 3,677,631.
Johnson, Robert B., 3,677,455.
Johnson, Robert B.; and Kirn, Thomas G., 3,677,498.
King, James L.; and Arrington, Lee O., 3,677,641.
Klanderman, Bruce H.; and Faber, Jan W. H., 3,678,072.
Knowles, Frederick G.; and Taylor, Clarence R., 3,677,487.
Looker, Jerome J.; and Fox, Charles J., 3,677,752.
MacDonald, William A., Jr., 3,677,632.
Morse, John E.; and Rosenburgh, Norman J., 3,677,864.
Ort, Wolfgang, 3,677,158.
Porter, Roy Donald, 3,677,163.
Rubin, Jacob C.; and Sukel, Gerald J., 3,677,069.
Sturm, Edward L., 3,677,157.
Van Lare, Earl J.; and Brooker, Leslie G. S., 3,678,045.
Vukosic, Robert S., 3,678,209.
Wangerin, Elmer O., 3,677,499.
Webb, Richard V., 3,677,964.
Willis, Roger L., 3,678,286.

Ebertin, Michel A., to North American Rockwell Corporation. Read-only random access serial memory systems. 3,678,476, Cl. 340-173.0sp.

Ebisch, Martin, to Siemens Aktiengesellschaft. Superheterodyne receiver with automatic tuning to a reception frequency. 3,678,394, Cl. 325-423.000.

Ebnother, Anton; Bastian, Jean-Michel; and Gadient, Fulvio, to Sandoz Ltd.; a/k/a and Sandoz A.G. 1,3,4,4a,5,9b-Hexahydro-5-phenyl-2H-indeno [1,2-c]-pyridines. 3,678,057, Cl. 260-293.540.

Ebnother, Anton; Bastian, Jean-Michel; and Rissi, Erwin, to Sandoz Ltd.; a/k/a and Sandoz A.G. 1,3,4,9b-Tetrahydro-2(2H)-indeno-[1,2-c] pyridines. 3,678,058, Cl. 260-293.540.

Eckert, Guenter; Marx, Matthias; Hartmann, Heinrich; and Wuertele, Lothar, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for dressing leather and the dressed leather. 3,677,813, Cl. 117-142.000.

Ecofon Verkaufsgesellschaft Probst KG: *See—*
Herterich, Walter; Probst, Georg; and Wurm, Bruno, 3,677,386.
Herterich, Walter; Probst, Georg; and Wurm, Bruno, 3,677,387.

Econo-Mail, Inc.: *See—*
Whitman, Nelson, 3,677,460.

Economou, Peter, to American Cyanamid Company. Manufacture of paper using amphoteric strengthening agents. 3,677,888, Cl. 162-164.000.

EdAids, Inc.: *See—*
Oberst, Charles V.; and Oberst, Glen C., 3,676,939.

Eddy, John W., to GTE Automatic Electric Laboratories Incorporated. Marker path finding arrangement including sound immediate ring. 3,678,208, Cl. 179-18.0ge.

Edlin, William Joel Reginald. Cleaning apparatus for floor coverings. 3,676,889, Cl. 15-320.000.

Edmisson, Russell C.; and Starr, Stanley R., to Mattel, Inc. Looped track system for toy wheeled vehicles. 3,677,469, Cl. 238-10.00e.

Edmonston, Robert P.; Gribens, Joel A.; and Simons, Charles W., to Grace, W. R., & Co. Compositions for gaskets having improved resistance to water-based aerosol products. 3,677,993, Cl. 260-33.60a.

Edwards, Frederick James, to Thermal Syndicate Limited. Tiled surface and method of application. 3,676,970, Cl. 52-385.000.

Edwards High Vacuum International Limited: *See—*
Wycliffe, Henryk; and Power, Basil Dixon, 3,677,664.

Eggleston, Philip William, to Imperial Chemical Industries, Limited. Process for making a patterened fabric by using differential shrinkage yarns. 3,676,906, Cl. 28-72.0ft.

Ehlert, Delbert D. Cable shackle. 3,676,899, Cl. 24-122.600.

Ehrat, Kurt. Circuit for generating a series of cipher pulses. 3,678,198, Cl. 178-22.000.

Ehrenreich, A., & Cie.: *See—*
Scheerer, Wolfgang, 3,677,585.
Schmidt, Andreas; and Muller, Paul, 3,677,587.
Stuck, Klaus, 3,677,586.

Eichner, Martin: *See—*
Reidmann, Manfred; and Eichner, Martin, 3,677,709.

Eig, Merrill; and Scavuzzo, John J., to United States of America, Army. Apparatus for laboratory simulation of ballistic field testing. 3,677,063, Cl. 73-7.000.

Elazar, Shmuel: *See—*
Funfstuck, Horst; and Elazar, Shmuel, 3,677,260.

Elbert, Raymond J.; and Farrier, Ernest G., to Union Carbide Corporation. Porous metal bodies of uniform porosity. 3,677,721, Cl. 29-182.200.

Eldamati, Salah Eldin A.: *See—*
Coccagna, Daniel T.; and Eldamati, Salah Eldin A., 3,677,200.

Elder, Frederick A., to Westinghouse Electric Corporation. Portable circuit breaker tester for calibrating a circuit breaker over a wide range of current. 3,678,372, Cl. 323-45.000.

Electro-Mechanical Instrument Company, Inc.: *See—*
Mackenzie, Elbert K., 3,677,619.

Electronic Associates, Inc.: *See—*
Patmore, James R.; Bozenhard, Walter Frank; and Spampanato, Gavino Anthony, 3,678,258.
Tempel, George F., 3,678,402.

Electronic Memories & Magnetics Corporation: *See—*
Morgan, Donald G., 3,678,427.

Electroprint, Inc.: *See—*
Noon, Alonzo W., 3,677,224.

Elenburg, Wayland D. Core retrieving apparatus. 3,677,355, Cl. 175-215.000.

Elfab Corporation: *See—*
Kendall, Jerry A., 3,676,926.

Elkins, James L. Non-polluting exhaust system for internal combustion engines. 3,677,239, Cl. 123-119.00a.

Ellendt, Gunther: *See—*
Thiel, Reinhard; and Ellendt, Gunther, 3,677,819.

Ellis, Lowell V.: *See—*
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., 3,677,401.

Ellis, Willard H.: *See—*
Bokros, Jack C.; and Ellis, Willard H., 3,677,795.

Elrod, Daniel W. Record display device. 3,676,942, Cl. 40-124.200.

Elting, Katherine Anne C.: *See—*
Browning, William C.; Perricone, Alphonse C.; and Elting, Katherine Anne C., 3,677,961.

Emisco, Inc.: *See—*
Hansen, Poul E., 3,677,237.

Emmer, Rudolf: *See—*
Bergmeyer, Hans Ulrich; Naher, Gotthilf; Thum, Waldemar; Lauerer, Albert; and Emmer, Rudolf, 3,677,901.

Emmons, William D.: *See—*
Lewis, Sheldon N.; Merritt, Richard F.; and Emmons, William D., 3,678,098.

Engelhard Minerals & Chemicals Corporation: *See—*
Keith, Carl D.; Haley, Alfred J., Jr.; and Kero, Robert M., 3,677,815.

Engelhardt, Walter; and Bernhardt, Bruno Friedrich, to Drohmann, Carl, Gesellschaft mit beschrankter Haftung. Apparatus for wrapping bulky or stacked objects. 3,676,980, Cl. 53-183.000.

Enger Kress Company: *See—*
Kery, Ervin, 3,677,317.

Enthone, Incorporated: *See—*
Brindisi, Frank A., Jr.; Nagy, Joseph S.; and Yarkosky, Eugene F., 3,677,949.

Environment/One Corporation: *See—*
Ludewig, Frederick A., Jr.; and Van Luik, Frank W., Jr., 3,678,487.
Skala, George F., 3,678,488.

Environmental Sciences, Inc.: *See—*
Boorujy, Salem, 3,677,413.

Erben, Klaus Dieter; Kroy, Walter; and Mehnert, Walter Erich, to Messerschmitt-Bolkow-Blohm GmbH. Measuring device for use in moving bodies for navigation purposes to determine the change of orientation thereof. 3,678,380, Cl. 324-83.00a.

Erdmann, Hans, to ITT Industries, Inc. Booster for hydraulic systems. 3,677,006, Cl. 60-54.60p.

E.R.E. Laboratory, Inc.: *See—*
Walker, Richard K., 3,677,628.

Erickson, Porter W.: *See—*
Augl, Joseph M.; Bailey, William J.; and Erickson, Porter W., 3,677,787.

Ericsson Telephones Limited: *See—*
Sinclair, William, 3,678,477.

Erikson, Uno Eugen: *See—*
Bjork, Lars; Erikson, Uno Eugen; and Ingelman, Bjorn Gustav-Adolf, 3,678,152.

Erlandson, Paul M.; Aschberger, Anton A.; and Cary, John T., to Continental Can Company, Inc. Inert atmosphere tack welder. 3,678,241, Cl. 219-72.000.

Erxleben, Ewald: *See—*
Raban, Joachim; Erxleben, Ewald; and Wildenau, Wolfgang, 3,677,806.

Espinos, Jose M.: *See—*
Esteve, Antonio; and Espinos, Jose M., 3,678,040.

Esposito, Joseph Alexander. Dispensing liner and pad for utensils. 3,677,438, Cl. 221-63.000.

Esso Production Research Company: *See—*
Childers, Thomas W.; Burkhardt, Joseph A.; and Koerner, Roger J., 3,677,001.

Esso Research and Engineering Company: *See—*
Boggs, Jesse K., 3,678,123.
Holt, Thomas E.; and Taylor, Edward B., 3,677,850.
King, William H., Jr.; and Dietz, Walter A., 3,677,066.
Mertzweiller, Joseph K.; and Tenney, Horace M., 3,677,969.
Mertzweiller, Joseph K.; and Tenney, Horace M., 3,677,970.
Minckler, Leon Sherwood, Jr., 3,678,013.
Wagensommer, Joseph, 3,678,019.

Esteve, Antonio; and Espinos, Jose M., to Laboratorios del Dr. Esteve, S.A. and Laboratorios Espinos y Bofill S.A. Process for the preparation of hydroxybenzene sulfonates of morpholinomethyl aminooxazolidones. 3,678,040, Cl. 260-240.00a.

Estin, Hans H.: *See—*
Merrill, Edward W., 3,677,444.

Estlick, Raymond J., to Raytheon Company. Hydraulic power unit. 3,677,005, Cl. 60-54.60a.

Estradier, Francoise: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,677,690.

Etablissements Clin-Byla: *See—*
Mousseron, Max J., 3,678,041.

Etat Francais: *See—*
Maxime, Jacques Paul Robert; and Maurel, Andre Bernard, 3,677,134.

Etchell, Gordon, to North American Rockwell Corporation. Printing plates in registry. 3,677,121, Cl. 83-437.000.

Etcheverry, John P.: *See—*
Greenwood, Roger; and Etcheverry, John P., 3,677,298.

Etherington, Roger F., to California Injection Molding Co., Inc. Fluidic sensing for molding system. 3,677,680, Cl. 425-129.000.

Ethyl Corporation: *See—*
Dubeck, Michael; and Shubkin, Ronald L., 3,678,083.
Klopfer, Oskar E. H., 3,678,113.
Woolensak, John C.; and Napolitano, John P., 3,678,112.

Ettischer, Helmut, to Eastman Kodak Company. Simplified synchronizing mechanism for cameras adapted to use mechanically fired flash lamps. 3,677,156, Cl. 95-11.50r.

Eubank, Joseph P., Jr. Picture frame. 3,676,944, Cl. 40-155.000.

Eubanks, Edgar W.: *See—*
Meyers, Raymond E.; and Eubanks, Edgar W., 3,678,004.

European Atomic Energy Community (Euraton): *See—*
Buzzi, Umberto; Dufresne, Jacques Pierre; and Farfaletti-Casali, Flaviano, 3,677,328.

Evans, Christopher Charles, to United Kingdom, Secretary of State for Defence in the Government of the. Furnace for the manufacture of ceramics whiskers. 3,677,713, Cl. 23-277.00r.

Evans, David B.: *See—*
Perrin, Alfred J.; Dell John D.; Evans, David B.; and Lewis, George Stanley, 3,677,339.

Evans, Geoffrey Ian: *See—*
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Faber, Jan W. H.: *See—*
Klanderman, Bruce H.; and Faber, Jan W. H., 3,678,072.

Fagen, John. Compressor for cam follower spring. 3,676,913, Cl. 29-217.000.

Fagersta Bruks Aktiebolag: *See—*
Loqvist, Kaj-Ragnar, 3,677,060.

Fairchild Camera and Instrument Corporation: *See—*
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Fairfield Engineering & Manufacturing Company: *See—*
Blough, Ronald S.; and Curry, Norval, 3,677,229.
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Fairfield, Hugh J., to Du Pont of Canada Limited. Crimped discontinuous filaments. 3,676,991, Cl. 57-140.00r.

Fairfield-Noble Corporation: *See—*
Igneri, Anthony V.; Milack, Joseph, Jr.; and Longo, John, 3,677,205.

Fanshawe, William Joseph: *See—*
Bauer, Victor John; Fanshawe, William Joseph; and Wiegand, Gretchen Ellen, 3,678,062.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
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Farfaletti-Casali, Flaviano: *See—*
Buzzi, Umberto; Dufresne, Jacques Pierre; and Farfaletti-Casali, Flaviano, 3,677,328.

Farr, John B.; and Landrum, Ralph A., Jr., to Amoco Production Company. Geophysical surveying using Fresnel pilot signals. 3,678,454, Cl. 340-15.5rs.

Farrier, Ernest G.: *See—*
Elbert, Raymond J.; and Farrier, Ernest G., 3,677,721.

Fassler, Edwin Eduard. Coupling for combustion tubes. 3,677,515, Cl. 251-149.700.

Fastener Corporation: *See—*
Ramspeck, Howard B.; and Obergfell, Allen R., 3,677,456.
Ramspeck, Howard B.; and Novak, Raymond F., 3,677,457.

Faw, Frederick L.; Johnson, Ralph E.; Warren, Constance A.; and Glenn, Dwight W., to United States of America, Health, Education and Welfare. Standardized set of compensating filters for mantlefield radiation therapy. 3,678,233, Cl. 250-86.000.

Fearing, Ralph B., to Stauffer Chemical Company. Pesticidal phosphoro and phosphono acetylhydrazides. 3,678,165, Cl. 424-211.000.

Fearnow, Philip W: *See—*
Adams, Philip E.; and Fearnow, Philip W, 3,678,140.

Fearon, Frederick W. G.: *See—*
Saam, John C.; and Fearon, Frederick W. G., 3,678,125.
Saam, John C.; and Fearon, Frederick W. G., 3,678,126.

Feiner, Maria; Gubler, Michel; and Guillon, Joseph, to Monsanto Company. Flame retardant composition comprising an organic bromine compound, an organic phosphate and a lead salt. 3,677,942, Cl. 252-8.100.

Feldman, Julian: *See—*
Frampton, Orville D.; and Feldman, Julian, 3,678,118.

Felici, Alberto: *See—*
Appiani, Edoardo; and Felici, Alberto, 3,678,175.

Felstead, Edward, to Imperial Chemical Industries Limited. Spray-drying process. 3,677,321, Cl. 159-48.000.

Fergus, Richard W., to United States of America, Atomic Energy Commission. Telemonitoring system. 3,678,512, Cl. 340-408.000.

Ferm, Carl W.; and Sechler, Fred R. Sewage treatment system. 3,677,409, Cl. 210-195.000.

Ferner, Jack D.: *See—*
Higgins, Irwin R.; and Ferner, Jack D., 3,677,937.

Fernseh GmbH: *See—*
Dillenburger, Wolfgang, 3,678,195.

Ferranti, Limited: *See—*
James, Frank Anthony, 3,678,429.

Ferrari, Harry M., to Westinghouse Electric Corporation. Internally pressurized fuel element. 3,677,894, Cl. 176-68.000.

Ferrari, Leonard A., to Bell & Howell Company. Image display from continuously moving image carrier. 3,677,626, Cl. 352-109.000.

Fesperman, Jerome M.: *See—*
Mazzara, Vincent B.; and Fesperman, Jerome M., 3,677,941.

Feuersanger, Alfred E.; and Harris, Lawrence M., to United States of America, Army, mesne. Photolithographic etching method for nickel oxide. 3,677,847, Cl. 156-8.000.

Field, George Francis; Sternbach, Leo Henryk; and Zally, William Joseph, to Hoffmann-La Roche Inc. 1,4-Benzodiazepin-3-ones and methods for the preparation thereof. 3,678,038, Cl. 260-239.30d.

Fieldcrest Mills, Inc.: *See—*
Mac Isaac, John T., Jr.; and Troy, James E., 3,677,206.

Files, William C., to McGraw-Edison Company. Slant mounted laundry machine. 3,677,039, Cl. 68-146.000.

Fillingham, Stephen Harvey: *See—*
Robinson, Brian; and Fillingham, Stephen Harvey, 3,677,693.

Finch, Neville, to Ciba-Geigy Corporation. 3-Hydroxycyclopentyl-alkanoic acids. 3,678,092, Cl. 260-468.00r.

Finckh, Hermann, Metalltuch-und Maschinenfabrik: *See—*
Holz, Emil, 3,677,402.

Fincor, Inc.: *See—*
Bucek, Jiri B.; and Shultz, James R., 3,678,355.

Findlay, Campbell, to Burroughs Corporation. Uniform ribbon feed apparatus. 3,677,486, Cl. 242-67.400.

Fink, Robert H.; and Palm, Eugene J., to United States of America, Army. Rocket motor and method. 3,677,010, Cl. 60-220.000.

Finkelstein, Ehud, to Merck & Co., Inc. Process for separating an acid from an amide. 3,678,060, Cl. 260-295.50a.

Finlay, Walter L.; Fisher, Henry J.; and Hay, Donald A., to Copper Range Company. Copper base composition. 3,677,745, Cl. 75-153.000.

Fiore, Joseph P., to Zenith Radio Corporation. Manufacture of shadow mask color picture tube. 3,676,914, Cl. 29-25.160.

Fiorucci, Georges P. Arrangement provided with a photo-cell and controlling the detecting means and the stop motion in a loom upon breaking of a thread in the warping, weaving and knitting systems. 3,677,307, Cl. 139-353.000.

Firestone, Raymond A., to Merck & Co., Inc. Method for the preparation of (cis-1,2-epoxypropyl)phosphonic acid products. 3,678,078, Cl. 260-348.00r.

Fisch, Willy: *See—*
Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans, 3,678,009.

Fischer, Artur. Method of making structural element. 3,676,918, Cl. 29-453.000.

Fischer, Gerd; Straub, Dieter; and Voigt, Heinz Eberhard, to Licentia Patent-Verwaltungs-G.m.b.H. Logic module connected to act as flip-flop. 3,678,301, Cl. 307-289.000.

Fischer, William K., to Uniroyal, Inc. Thermoplastic polymer blends containing polyvinyl chloride, polyether urethane and butadiene-acrylonitrile copolymers. 3,678,129, Cl. 260-859.0pv.

Fischman, Martin, to GTE Laboratories Incorporated. Sawtooth current generator. 3,678,331, Cl. 315-27.0td.

Fisher, Henry J.: *See—*
Finlay, Walter L.; Fisher, Henry J.; and Hay, Donald A., 3,677,745.

Fisons Limited: *See—*
Miller, John; and Searle, Martin, 3,678,114.

Fitton, Peter: *See—*
Rick, Edward A.; McKeon, James E.; Fitton, Peter; and Argento, Benny J., 3,678,085.

Fitzgerald, James E., to North American Rockwell Corporation. Petri dish including a chamber for a sterilized specimen-spreading element and process for using the petri dish. 3,677,904, Cl. 195-103.5.

Fleck Industries, Inc.: *See—*
Berg, Coleman David, 3,677,485.

Fleischer, Robert L.; and Price, Paul B., to General Electric Company. Process for making an elastic stretchy sheet containing apertures having a diameter of at least five angstroms and being suitable as a molecular sieve. 3,677,844, Cl. 156-2.000.

Fletcher, H. E., Co.: *See—*
Fletcher, Ralph A.; and Oliver, Joseph R., 3,677,258.

Fletcher, Ralph A.; and Oliver, Joseph R., to Fletcher, H. E., Co. Apparatus for continuously gauging and cutting stone in a guillotine type cutting machine. 3,677,258, Cl. 125-23.00c.

Fletcher, Roy W.; and Forte, Anthony D., to Union Special Machine Company. Blindstitch sewing machine. 3,677,208, Cl. 112-178.000.

Fleuret, Louis; and Trepaez, Jean, to Uniroyal Englebert France S.A. Process for manufacturing belted tires. 3,677,852, Cl. 156-127.000.

Fleury, Jean, to Regie Nationale des Usines Renault. Machine for electrochemically machining workpieces. 3,677,928, Cl. 204-224.000.

Flick, Kenneth E., to Jewel Manufacturing Company. Scaffolding clamp. 3,677,582, Cl. 287-49.000.

Floessel, Dieter, to Aktiengesellschaft Brown, Boveri & Cie. Compressed gas switch having columnar construction. 3,678,234, Cl. 200-148.00b.

Fluorodynamics, Inc.: *See—*
Roberts, Robert, 3,677,845.

FMC Corporation: *See—*
Ager, John W., 3,678,106.
Castrantas, Harry M.; Keay, Robert E.; and MacKellar, Donald G., 3,677,955.
Lynch, Charles Andrew, Jr.; and Orwoll, Edward Francis, 3,678,086.

Fogle, William A., Jr.; Jason, Joseph B.; and Head, Richard A. Steamer and soda-dispensing system. 3,677,173, Cl. 99-357.000.

Foley, John J.; Satas, Wallace J.; and Konkel, Joseph, to Data Printer Corporation. Ribbon control apparatus for high speed printers. 3,677,176, Cl. 101-96.000.

Fontan, Andre; and Benac, Rene. Straddle tractors. 3,677,572, Cl. 280-39.000.

Forbro Design Corporation: *See—*
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Ford, Allen G. Skirted air cushioned planing hull. 3,677,213, Cl. 114-67.00a.

Ford, George L.: *See—*
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Ford, John A., Jr.; McConkey, Robert C.; and Laakso, Thomas M., to Eastman Kodak Company. Photosensitive element comprising light sensitive polymers and process of using. 3,677,754, Cl. 96-35.100.

Ford, Stanley Denis: *See—*
Dugdale, Ronald Arthur; Ford, Stanley Denis; and Maskrey, John Thomas, 3,678,334.

Foreman, Christopher Roy; and Shipman, Patricia Violet, to Patent Protection Limited. Power driven air filter. 3,676,985, Cl. 55-317.000.

Formaini, Richard E., to Allied Chemical Corporation. Liquid fertilizer suspension containing ureaform. 3,677,736, Cl. 71-28.000.

Formica Corporation: *See—*
Oliver, Jay Thomas, 3,677,876.

Forssblad, Lars-Henrik; and Jerkeman, Per, to Korsnas-Marma Aktiebolag. Method of producing highly absorbent cellulose. 3,677,886, Cl. 162-72.000.

Forster, Friedrich M. O. Apparatus for repairing defects in metallic workpieces by automatic means. 3,676,959, Cl. 51-165.00r.

Forte, Anthony D.: *See—*
Fletcher, Roy W.; and Forte, Anthony D., 3,677,208.

Fortener, Edward J.: *See—*
Rivers, Richard D.; Byers, Thomas W.; and Fortener, Edward J., 3,677,289.

Foseco International Limited: *See—*
Austin, George Wesley, 3,677,325.

Foster Wheeler Corporation: *See—*
Hill, William G., 3,678,239.

Fowler, Richard Payson, to Johns-Manville Corporation. Electrolytic process and apparatus for recovering nickel from asbestos ore. 3,677,919, Cl. 204-113.000.

Fox, Charles J.: *See—*
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Fradette, Joseph J., to White Motor Corporation. Apparatus for incandescent filament mounting. 3,678,266, Cl. 240-90.000.

Frame S.A.: *See—*
Belaieff, James Frank, 3,677,473.

Frampton, Orville D.; and Feldman, Julian, to National Distillers and Chemical Corporation. Process for preparing ethanol. 3,678,118, Cl. 260-641.000.

Francis, Donald R.; and Haberlin, Richard J., to Polaroid Corporation. Novel photographic processes. 3,677,753, Cl. 96-29.000.

Francis, Joseph S. Meat pickling machines and the like. 3,677,169, Cl. 99-256.000.

Francis, Marion D., to Procter & Gamble Company, The. Compositions for inhibiting anomalous deposition and mobilization of calcium phosphate in animal tissue. 3,678,164, Cl. 424-204.000.

Frank, Arlen W.; and Baranauckas, Charles F., to Borg-Warner Corporation, mesne. 2-Haloperfluoro-1-cycloalken-1-yl phosphoryl compounds and process for the preparation thereof. 3,678,100, Cl. 260-502.40r.

Franklin, Charles Henry: *See—*
Rice, Edwin Eugene; and Franklin, Charles Henry, 3,676,963.

Franklin, LeRoy H. High power fuse. 3,678,431, Cl. 337-185.000.

Frans, Robert D. Apparatus for reducing oxygen content of oxidic mineral ore. 3,677,534, Cl. 266-20.000.

Franzen, Walter B., to Whitney, W. A., Corporation. Power operated I-beam rotator. 3,677,418, Cl. 214-1.0qc.

Fraser, Alan R., to Gray-Tim, Inc. Process for producing battery-grade manganese dioxide. 3,677,700, Cl. 23-145.000.

Frati, Augustus. Forms for concrete wall construction. 3,676,967, Cl. 52-220.000.

Frederik, Johannes van Roessel: *See—*
Boxman, Peter; and Frederik, Johannes van Roessel, 3,678,182.

Freeman, Carlos A., Jr. Reaction--impulse--counterrotating--airfoil. 3,677,503, Cl. 244-23.

Freeman, Richard B.; Kawalec, Michael T.; Maholick, Andrew W.; and Stager, Stanley R., III, to International Business Machines Corporation. Universal cyclic division circuit. 3,678,469, Cl. 340-172.500.

Freer, Edgar P., to Hubach-Freer Corporation, mesne. Precision digital linear adjustment mechanism and height gage embodying same. 3,676,934, Cl. 33-169.00r.

Fremiot, Charles, to Commissariat a l'Energie Atomique. Waveguide device for bringing an element to a high direct-current potential. 3,678,365, Cl. 321-8.00r.

Frenken, Hans: *See—*
Herzhoff, Peter; Gref, Hans; Wolfgang, Leverkusen; Frenken, Hans; Assenmacher, Peter; and Westen, Dietmar, 3,677,076.

Frese, Albert, to Chemische Werke Huels Aktiengesellschaft Patentabteilung. Process for the production of free-flowing, granular, atactic polybutene-1. 3,678,023, Cl. 260-93.700.

Frick Company: *See—*
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Frieber, George: *See—*
Arvay, Frank Joseph; Frieber, George; Lechleider, Joseph William; and Sutton, Robert Anderson, 3,678,379.

Friley, Paul B.: *See—*
Siegfried, Edward C.; Harwell, Conner J.; and Murphy, Shields, 3,677,687.

Frump, John A., to Commercial Solvents Corporation. Production of hydroxymethyl vinyl oxazoline. 3,678,065, Cl. 260-307.00f.

Frymire, Garold D.: *See—*
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Fuchi, Yoshikane: *See—*
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Fuchs, Francis Joseph, Jr.: *See—*
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Fuchs, Francis Joseph, Jr., to Western Electric Company, Incorporated. Method of positive flow extrusion. 3,677,048, Cl. 72-60.

Fuji Photo Film Co., Ltd.: *See—*
Amano, Hiroyuki; Tsuji, Nobuo; and Shirasu, Kazuo, 3,677,762.
Iwano, Haruhiko; and Shimamura, Isao, 3,677,760.
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Tamai, Yasuo; Osawa, Sadao; and Taguchi, Seiichi, 3,677,766.

Fujimori, Yoshiaki, to Kabushiki Kaisha Suwa Seikosha. Waterproof watch case. 3,676,996, Cl. 58-90.00r.

Fujimori, Yoshiaki, to Kabushiki Kaisha Suwa Seikosha. Structure for sealing a watch crystal in a waterproof watch. 3,676,997, Cl. 58-90.00r.

Fujimoto, Hiroshi; and Fukuda, Mitsugu, to Kurita Water Industries Ltd. and Unitika Ltd. Method of treating scouring and dyeing waste water. 3,677,940, Cl. 210-44.000.

Fujisaki, Hiroya: *See—*
Iwasaki, Masahiro; Goto, Nobuyuki; Fujisaki, Hiroya; and Niwa, Kunihiko, 3,678,390.

Fujisawa, Tamotsu; Yamamoto, Mizuo; and Tsuchihashi, Genichi, to Sagami Chemical Research Center. Process for production of sulfur-containing phenols. 3,678,115, Cl. 260-609.00f.

Fujitsu Limited: *See—*
Nagamatsu, Takeo; Yamada, Yusaku; and Yamada, Kazumi, 3,678,498.

Fujiwara, Ryozo; Ohara, Eiji; and Maeda, Kazuo, to Mitsui Toatsu Chemicals, Inc. Method of stabilizing anhydrous sodium dithionite. 3,677,699, Cl. 23-116.000.

Fukao, Satoshi: *See—*
Iwashima, Hideo; and Fukao, Satoshi, 3,678,424.

Fukuda, Mitsugu: *See—*
Fujimoto, Hiroshi; and Fukuda, Mitsugu, 3,677,940.

Fukui, Hisaaki; Araki, Taketoshi; and Fuchi, Yoshikane, to Asahi Kasei Kogyo Kabushiki Kaisha. Relief lithographic plates and photosensitizing solutions. 3,677,755, Cl. 96-35.100.

Fukuma, Noboru; Kobayashi, Hidehiko; Matsui, Kenichi; Sakashita, Masahira; and Henmi, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Synthetic conjugate filament fibers and a process for the manufacture of the same. 3,677,880, Cl. 161-173.000.

Fukushima, Mitsuyoshi: *See—*
Oohara, Saburo; Amemiya, Koitsuro; Nishijima, Yasushi; Fukushima, Mitsuyoshi; and Shimizu, Kunio, 3,677,871.

Fukushima, Osamu: *See—*
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Fulmer, Keith H.: *See—*
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Fulmer, Keith H., to Bendix Corporation, The. Subsidiary supply for hydraulic brake booster. 3,677,002, Cl. 60-52.00b.

Funasaki, Yasuo: *See—*
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Funfstuck, Horst; and Elazar, Shmuel, to Statham Instruments Inc. Arrhythmia detector. 3,677,260, Cl. 128-2.06a.

Furlong, Owen D.; Rowe, Alan C.; and Wright, Eric F., to Westland Aircraft Limited. Fluid flow control systems. 3,677,293, Cl. 137-561.000.

Furman, Neonil Izrailevich: *See—*
Scherban, Alexandr Nazarievich; Furman, Neonil Izrailevich; Sotnichenko, Boris Feodosievich; Belogolovin, Nikolai Stefanovich; Chopovsky, Jury Ivanovich; Sutormin, Jury Nikolaevich; Zaitsev, Valentin Ivanovich; Kot, Vladimir Ivanovich; Mikhailjuk, Nikolai Tarasovich; Denisenko, Sergei Andreevich; Chaschinov, Anatoly Vasilievich; Shaporev, Stepan Vasilievich; and Samoilenko, Svetlana Mikhailovna, 3,678,489.

Furukawa, Fujio: *See—*
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Furukawa, Teruo: *See—*
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G. & W. H. Corson Inc.: *See—*
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Gadient, Fulvio: *See—*
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Gadre, Jean-Claude: *See—*
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GAF Corporation: *See—*
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Gagliardi, Domenick Donald, to Commercial Solvents Corporation. Oil repellant fibrous materials and preparation thereof. 3,677,812, Cl. 117-139.50a.

Gagnaux, Pierre, to Sandoz Ltd.; a/k/a and Sandoz A.G. Preparation of O,O-dimethyl-thionophosphoric acid[O-quinoxalyl-(2)]ester. 3,678,050, Cl. 260-250.00r.

Gaia, Aldino J., to McGraw-Edison Company. Protector for electric circuit. 3,678,430, Cl. 337-159.000.
Gamble, Robert P.: *See—*
Tien, John K.; and Gamble, Robert P., 3,677,835.
Gamon-Camet Industries, Inc.: *See—*
Masson, Narinder; Korenicki, William John; and Lechner, Walter Ludwig, 3,677,084.
Gamson, Michael J. Jumper cable. 3,678,438, Cl. 339-29.00b.
Gansheimer, Josef; and Schanzer, Oswald, to Dow Corning Corporation. Extreme pressure lubrication through additives. 3,677,946, Cl. 252-51.50a.
Ganzhorn, Harry E., to Raychem Corporation. Self-locking heat shrinkable insulating sleeve. 3,678,174, Cl. 174-84.00r.
Garland, Carl C., to Parke, Davis & Company. Vibratory cleaner. 3,676,958, Cl. 51-163.000.
Garnier, Michel Robert; and Rioux, Christian Paul Gilbert, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Jet propulsion power plant. 3,678,306, Cl. 310-11.000.
Garrett Corporation, The: *See—*
Barnett, Morris A.; and Silver, Alexander, 3,677,612.
Garrigus, James P., to Chicago Bridge & Iron Company. Corrosion protection for well casing of offshore structure. 3,677,016, Cl. 61-46.500.
Garven, Ernest H. Cymbal attachment. 3,677,127, Cl. 84-402.000.
Gast, Gerald E., to Whirlpool Corporation. Band remover for cartons. 3,677,519, Cl. 254-131.000.
Gately, Joseph R., to Forbro Design Corporation. Voltage limiting circuit for constant-current power supplies. 3,678,370, Cl. 323-4.000.
Gates Rubber Company, The: *See—*
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Gearhart-Owen Industries, Inc.: *See—*
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Geigy Chemical Corporation: *See—*
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Geissler, Ulrich M., to Harrington-Geissler & Associates, Inc. Rotary tool and turbine therefor. 3,677,351, Cl. 173-57.000.
Gele, Pierre; and Laprade, Bernard, said Laprade, Bernard assor. to and Les Usines Laprade S.A. Carburettors operating under a constant reduced pressure. 3,677,241, Cl. 123-119.0db.
Gemco Electric Company: *See—*
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Gentemann, Arthur J. Rowing device. 3,677,216, Cl. 115-24.100.
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Gerber, Heinz Joseph; and Pearl, David Raymond, to Gerber Garment Technology, Inc. Penetrable bed used for cutting sheet material. 3,677,123, Cl. 83-561.000.
Gertsik, Mikhailovich: *See—*
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Gerwig, Jeffrey C., to Windings, Inc. Box with inwardly tapering guide cones for universal wind package with radial pay-out. 3,677,491, Cl. 242-163.000.
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Ghosh, Ranajit; and Bishop, Nigel Douglas, to Imperial Chemical Industries Limited. Fungicidal composition containing thio-carbamyl-α-lactones. 3,678,167, Cl. 424-248.000.
Giacino, Christopher: *See—*
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Gibbs, James C.; and Daninhersch, Harry, to Connor Engineering Corporation. Adjustable air pattern air diffuser. 3,677,165, Cl. 98-40.0dl.
Gibbs, James W.; and Gibbs, John L., to Marine Bank and Trust Company, mesne. Hydraulic flush tank. 3,677,294, Cl. 137-572.000.
Gibbs, John L.: *See—*
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Gidon Industries Limited: *See—*
Wright, Peter C.; and Kirsch, Donald L., 3,677,365.
Giesecke, Frederick Adolph, to CPC International Inc. Pressure venting assembly. 3,677,290, Cl. 137-528.000.
Giffen, James W. Article transfer apparatus. 3,677,419, Cl. 214-1.0bv.
Gilbert, Roswell W., to Technical Management Services, Inc. Target indicating system and method. 3,678,495, Cl. 340-323.000.
Giles, Walter W. Tallying devices. 3,677,221, Cl. 116-135.000.
Giljarhus, Gunnar; and Vien, Hans, to A/S Raufoss Ammunisjonsfabrikker. Projectile with multiple effect. 3,677,181, Cl. 102-52.000.
Gillery, Frank H., to PPG Industries, Inc. Process for forming electroconductive tin oxide films by pyrolyzation of alkyl and aryl tin fluorides. 3,677,814, Cl. 117-211.000.
Gillette Company, The: *See—*
Pearson, Harold E., 3,676,902.
Gilsdorf, Richard C., to Bell & Howell Company. Yieldable electrical plug. 3,678,440, Cl. 339-61.00r.
Giolito, Silvio L.; and Mirviss, Stanley B., to Stauffer Chemical Company. Triaryl phosphate functional fluids. 3,677,948, Cl. 252-78.000.
Gipe, Harry F., to Scott Paper Company. Dry planographic plates and methods, production and use. 3,677,178, Cl. 101-450.000.
Girard, Roland T.; and Rice, George A., to General Electric Company. Protective coating to inhibit oxidation and/or carburization of metallic surfaces. 3,677,796, Cl. 117-70.00a.
Girling Limited: *See—*
Hodges, Peter Kinson, 3,678,232.
Newstead, Charles; Cullen, John Lesley; and Zajko, Michal, 3,677,374.
Girola, Angelo. Master for machine tools, particularly for milling machines, to remove metal by level layers. 3,677,136, Cl. 90-62.000.
Givaudan Corporation: *See—*
Kitchens, Garry C.; Hochstetler, Alan R.; and Kaiser, Kent, 3,678,119.
Glass, Eduard; and Alker, Heinrich. Radial tires. 3,677,318, Cl. 152-356.000.
Glathe, Wolfgang, to Schlumberger Overseas Messgeratebau und Vertrieb GmbH. Amplifier stage circuit for a logarithmic amplifier. 3,678,294, Cl. 307-230.000.
Glaverbel S.A.: *See—*
Plumat, Emile, 3,677,729.
Gleixner, Franz, to Sick, Erwin, Firma. Photoelectric sensing device. 3,678,281, Cl. 250-216.000.
Glenn, Dwight W.: *See—*
Faw, Frederick L.; Johnson, Ralph E.; Warren, Constance A.; and Glenn, Dwight W., 3,678,233.
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Glockner, Hans; Meier, Ernst; and Puschel, Walter, to Agfa-Gevaert Aktiengesellschaft. Silver halide emulsion containing purple coupler for color photography and process of making the same. 3,677,764, Cl. 96-100.000.
Godel, Albert, to Societe Anonyme Activit. Process of activation and gasification of fluidised carbonaceous materials. 3,677,727, Cl. 48-206.000.
Goldmark, Peter C.; and Hollywood, John M., to Columbia Broadcasting System, Inc. Color film recording and reproducing apparatus. 3,678,181, Cl. 178-5.20r.
Gooderum, Leoda J. Zipper foot attachment for sewing machines. 3,677,209, Cl. 112-240.000.
Goodman, Abraham H.: *See—*
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Goodman, H., & Sons, Inc.: *See—*
Goodman, Jacob, 3,677,270.
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Goodridge, Ernest E.: *See—*
Bosworth, Delbert B.; and Goodridge, Ernest E., 3,677,439.
Goodwin, Zeno E. Weighing apparatus for liquids. 3,677,356, Cl. 177-190.000.
Goodyear Tire & Rubber Company, The: *See—*
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Chung, Daniel A.; and Pearson, Charles J., 3,677,869.
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Gordon, Stuart; Evans, Geoffrey Ian; and Cunliffe, Alwyn, to Imperial Metal Industries (Kynoch) Limited. Solid propellant charge making in mold having perforated separator means. 3,678,138, Cl. 264-3.00r.
Gordon, William F.; and Newman, James W., to Windings, Inc. Package of flexible material. 3,677,490, Cl. 242-163.000.
Goscenski, Edward J., to Bendix Corporation, The. Concentric brake booster with moving hoses. 3,677,007, Cl. 60-54.60p.
Goscenski, Edward J., to Bendix Corporation, The. Mechanism for hydraulic brake booster. 3,677,138, Cl. 91-373.000.
Gosden, Derek Vernon: *See—*
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Gosling, Dickinson, to Labatt, John, Limited. End loading twin beverage carton. 3,677,458, Cl. 229-27.000.
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Gottweis, Gert; Herrlich, Michael; Klas, Gunther; Schober, Joachim; Thiede, Peter; and Zachaus, Eberhard, to Ingenieurburo fur Rationalisierung der Suss- und Dauerbackwarenindustrie. Apparatus for packing bags in boxes or cartons. 3,676,978, Cl. 53-59.00r.
Gough, Geoffrey R.: *See—*
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Edmonston, Robert P.; Gribens, Joel A.; and Simons, Charles W., 3,677,993.
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Graff, Jack; and Dora, Ralph A., to Packard Instrument Company, Inc., mesne. Reactor. 3,677,706, Cl. 23-230.00r.
Graff, William R., to Simplimatic Engineering Co. Missing container detector. 3,678,254, Cl. 235-92.0pk.
Graham, Richard E., to National Cash Register Company, The. Control means for an optical bar code serial printer. 3,678,465, Cl. 340-172.500.
Grainger, James William: *See—*
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Grandy, Andrew J. Wire forming apparatus. 3,677,309, Cl. 140-149.000.
Granqvist, Carl-Erik, to Aga Aktiebolag. Instrument for measuring distance. 3,677,646, Cl. 356-4.000.
Granryd, Eric G. U., to American Gas Association, mesne. Internal combustion heat engine and process. 3,677,026, Cl. 62-115.000.
Granryd, Eric G. U., to American Gas Association, mesne. Internal combustion heat engine and process. 3,677,027, Cl. 62-115.000.
Grauvogel, Kurt. Environmental control apparatus. 3,678,337, Cl. 317-4.000.
Gray, Dan E., to Shair of Canada Limited. Air cushion vehicle. 3,677,359, Cl. 180-121.000.
Gray, Kenneth R.: *See—*
Casebier, Ronald L.; Herrick, Franklin W.; Gray, Kenneth R.; and Johnston, Frederic A., 3,677,818.
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Fraser, Alan R., 3,677,700.
Green, Angelica G., to Kimberly-Clark Corporation. Gauze section for a surgical drape sheet. 3,677,266, Cl. 128-132.00d.
Green, Victor J. Trampoline. 3,677,368, Cl. 182-139.000.
Greenspan, Gilbert; Curtis, Lawrence R.; Cunningham, Elmer E.; and Tabler, James G. Apparatus for providing recorded chromatic data displays of varying sensor signals. 3,678,277, Cl. 250-83.30r.
Greenwood, Roger; and Etcheverry, John P., to International Telephone and Telegraph Corporation. Pilot valve operated main valve with lost motion connected and tandem operated valves. 3,677,298, Cl. 137-625.640.
Gref, Hans: *See—*
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Gregoire Engineering & Development Co.: *See—*
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Gregoire, Resta S., to Gregoire Engineering & Development Co. Submersible watercraft. 3,677,212, Cl. 114-61.000.
Grey, Michael W., to Addmaster Corporation. Checkwriter. 3,677,463, Cl. 235-58.cwm.
Gribens, Joel A.: *See—*
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Grier, Nathaniel, to Merck & Co., Inc., mesne. Nitroalkyl-piperazines for inhibiting bacteria fungi and nematodes. 3,678,168, Cl. 424-250.000.
Griffin & company: *See—*
Parker, Samuel A.; and Wilding, Edwin L., 3,677,390.
Griffith, James J., to United Aircraft Corporation. Load anticipation control for a free turbine type of power plant. 3,678,285, Cl. 290-40.000.
Griggs, Barbara Allen: *See—*
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Grindle, James L.: *See—*
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Groezinger, John J., to Caterpillar Tractor Company. Marking and detection of subsurface defects in multi-layer hose structures. 3,678,271, Cl. 250-71.50r.
Grolitzer, Arthur J.; and Mounts, Francis E., to Rheem Manufacturing Company. Optical crossbar switching device. 3,678,459, Cl. 340-166.00r.
Gross, F. R., Co. Inc.: *See—*
Gross, Frank Robert, 3,676,910.
Gross, Frank Robert, to Gross, F. R., Co. Inc. Machine for forming heat-exchanger fins. 3,676,910, Cl. 29-202.00d.
Grosse, Aristid V., to Reynolds Metals Company, mesne. Method of reducing reaction between adjacent layers of liquid substances having different densities. 3,677,326, Cl. 165-1.
Grossenbacher, Charles-Andre: *See—*
Simon-Vermot, Andre; and Grossenbacher, .Charles-Andre, 3,676,998.
Grosser, Frederick: *See—*
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Growth International Industries Corporation: *See—*
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Groz, Theodor & Beckert, Ernst Nadelfabrik: *See—*
Wiederhut, Wolfgang; Landenberger, Helmut; and Hofmann, Ulrich, 3,677,035.
Gruber, Eugene Gerald. Vehicle mounted warning device. 3,678,456, Cl. 340-87.000.
Gruenfeld, Norbert; and Pesterfield, Enos C., Jr., to Ciba-Geigy Corporation. Pyridyl-2-imidazolones as anti-inflammatory agents. 3,678,169, Cl. 424-263.000.
Grummon, Glenn D.; and Wiegert, Philip E., to Mallinckrodt Chemical Worsk. Method for preparing seleno-derivatives of α-amino acids. 3,678,067, Cl. 260-482.00r.
Gschwend, Heinz Werner; and deStevens, George, to Ciba-Geigy Corporation. 3-Aminoalkylidene-indazoles. 3,678,059, Cl. 260-295.50b.
GTE Automatic Electric Laboratories, Inc.: *See—*
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Reimer, William A., 3,678,176.
GTE Automatic Electric Laboratories Incorporated: *See—*
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GTE Laboratories Incorporated: *See—*
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GTE Sylvania Incorporated: *See—*
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Hunton, James Keith; Kelly, Wayne M.; and Takeuchi, James S., 3,678,395.
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Guarino, Henry R., to United States of America, Health, Education and Welfare, mesne. Volume metering apparatus for circulatory assist pumps. 3,677,092, Cl. 73-432.00a.
Gubin, Alexandr Ivanovich: *See—*
Maximovich, Boleslav Ivanovich; Dudko, Daniil Andreevich; Agafonov, Nikolai Georgievich; Maximov, Igor Petrovich; Andreev, Vadim Grigorievich; Lepilov, Nikolai Yakovlevich; Svinov, Alexei Kapitonovich; Slonimsky, Alexandr Borisovich; Volk, Boris Zakharovich; Gubin, Alexandr Ivanovich; and Katsman, Berta Osipovna, 3,677,330.
Gubler, Michel: *See—*
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Gudath, Ernest Andrew: *See—*
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Gugin, Robert J., to Agristeel Limited. Steering device for cultivating implements. 3,677,349, Cl. 172-285.000.

Gugol-Clini-Tex, Inc.: *See*—
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Guigan, Jean, to Hoffmann-La Roche Inc. Apparatus for transferring liquids. 3,677,091, Cl. 73-423.00a.

Guillon, Joseph: *See*—
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Gulf & Western Industries, Inc.: *See*—
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Gulf Oil Corporation: *See*—
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Koutz, Stanley L., 3,677,008.

Gulf Research & Development Company: *See*—
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Gulick, Ronald A.: *See*—
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Gullick Dobson Limited: *See*—
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Gump, Klaus H., to Celanese Corporation. Polymerization of aromatic nitriles in 2-pyrrolidinone as solvent and catalyst at elevated temperatures. 3,678,049, Cl. 260-248.0cs.

Gurkov, Konstantin Stepanovich: *See*—
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Gusev, Vladimir Alexeevich; and Rudenko, Nikolai Nikolaevich. Device for applying onto pipes coatings of viscous insulating substances. 3,677,862, Cl. 156-392.000.

Gussack, Seymour I.; and Berry, Hugh, to X-L-O Automotive Accessories, Inc. Bumper guard mounting assembly. 3,677,594, Cl. 293-67.000.

Gustafson, Craig S. Roof flange with elastomeric collar. 3,677,576, Cl. 285-43.000.

Gutberlet, Louis C.; and Bertolacini, Ralph J., to Standard Oil Company. Hydrocracking catalyst. 3,677,972, Cl. 252-455.00z.

Guyer, Reynolds W., Jr.; Cross, Norton M., Jr.; Griggs, Barbara Allen; and Lundquist, Martin A., to Guyer, Reynolds W., Jr.; d/b/a and Winson Concepts. Liquid gun for use on wheeled vehicle. 3,677,446, Cl. 222-177.000.

Guyer, Reynolds W., Jr.; d/b/a: *See*—
Guyer, Reynolds W., Jr.; Cross, Norton M., Jr.; Griggs, Barbara Allen; and Lundquist, Martin A., 3,677,446.

Haani, Martti: *See*—
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Habegger, Oskar: *See*—
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Habrich, Reiner: *See*—
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Hagihara, Takeaki: *See*—
Kai, Tsunetoshi; Hagihara, Takeaki; and Ishido, Teruhisa, 3,677,920.

Haigler, John S. Pill counting apparatus having chute shifting on predetermined count. 3,677,437, Cl. 221-7.000.

Halcon International, Inc.: *See*—
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Haley, Alfred J., Jr.: *See*—
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Haley, David J.; Cunningham, Robert E.; and Privott, Wilbur J., Jr., to Monsanto Company, mesne. Method and apparatus for taking up fiber. 3,677,481, Cl. 242-18.00r.

Hall, Douglas Wilson: *See*—
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Hall, William D.; and Shaefer, Lewis H., to KMS Indústries, Inc. Pressure sensitive fingerprint input for identification apparatus. 3,677,223, Cl. 118-10.000.

Hall, William D.; and Burzan, Vernon J., to KMS Industries, Inc. Clean window assembly for real time fingerprint input to fingerprint identification system. 3,677,623, Cl. 350-321.000.

Hallford, Ben R., to Collins Radio Company. Microstrip diode high isolation switch. 3,678,414, Cl. 333-7.000.

Hallford, Ben R., to Collins Radio Company. RF rejection filter. 3,678,433, Cl. 333-73.00s.

Hallmark, Bobby Joe, to Gearhart-Owen Industries, Inc. Sidewall well-formation fluid sampler. 3,677,080, Cl. 73-155.000.

Hamilton, Douglas L. P. Automobile bumper. 3,677,595, Cl. 293-73.000.

Hamilton Watch Company: *See*—
Bergey, John M.; Le Van, James O.; Walton, Richard S.; and Brethauer, Louis G., 3,676,993.

Hammoto, Kazuko: *See*—
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Hampel, Daniel, to RCA Corporation. Multi-function logic gate circuits. 3,678,292, Cl. 307-207.000.

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Hands, Clifford Henry George: *See*—
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Hanff, Herbert, to Licentia Patent-Verwaltungs-G.m.b.H. High-frequency drying apparatus. 3,676,936, Cl. 34-1.000.

Hannah, Bruce R.: *See*—
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Hansen, Poul E., to Emisco, Inc. Auxiliary air valve. 3,677,237, Cl. 123-97.00b.

Harada, Motoo; and Sasaki, Kenichi. Continuous vacuum advance system of ignition timing. 3,677,238, Cl. 123-117.00a.

Hardesty, Donald E.; and Rodgers, Thomas A., to Shell Oil Company. Molten salt hydroconversion process. 3,677,932, Cl. 208-108.000.

Hardy, Donald F., to Dart Industries, Inc. Method of coating irregular objects. 3,677,801, Cl. 117-94.000.

Harenberg, Harold L., Jr., to McDonnell Douglas Corporation. Performance and failure assessment monitor. 3,678,256, Cl. 235-150.200.

Hargash, Paul, to Dow Chemical Company, The. Feeder stream mixer. 3,677,522, Cl. 259-4.000.

Harigaya, Hiroshi: *See*—
Yamamura, Katsumi; Harigaya, Hiroshi; Kasai, Kazutomo; and Asahina, Michio, 3,677,744.

Harman, John N., III; and Neti, Radhakrishna M., to Beckman Instruments, Inc. NO_x analysis and scrubber therefor. 3,677,708, Cl. 23-232.00r.

Harmuth, Henning Friedolf, to International Telephone and Telegraph Corporation. Signal processing and transmission by means of walsh functions. 3,678,204, Cl. 179-15.0bc.

Harned, William L., to Eastman Kodak Company. Method of fine-grinding. 3,677,476, Cl. 241-21.000.

Harnish, Mark E.; and Peters, Merrit A., to International Minerals & Chemical Corporation. Use of refractory parting layer to aid skill removal from furnace linings. 3,678,143, Cl. 264-30.000.

Harrell, Marvin L.: *See*—
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Harrington, Jerry E., to Chrysler Corporation. Apparatus for the manufacture of powder metal helical gears. 3,677,672, Cl. 425-78.000.

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Harris, Lawrence M.: *See*—
Feuersanger, Alfred E.; and Harris, Lawrence M., 3,677,847.

Harris, Le Roy S., to K-G Industries, Inc. Shear and breaker means for briquetting apparatus. 3,677,683, Cl. 425-314.000.

Harris, Rano J., Jr.: *See*—
Harris, Rano J., Sr.; and Harris, Rano J., Jr., 3,677,448.

Harris, Rano J., Sr.; and Harris, Rano J., Jr., to Precision Sampling Corporation. Syringe with wire plunger for dispensing infinitesimally small, accurately measured quantities of fluid. 3,677,448, Cl. 222-387.000.

Harris, Richard A., to Western Electric Company, Incorporated. Apparatus for conveying and exposing a strip of radiant energy sensitive material. 3,677,644, Cl. 355-96.000.

Harris, Robert George, to Amchem Products, Inc. Permanganate silicate cleaner. 3,677,953, Cl. 252-103.000.

Hart, Dennis L.; and Howery, Robert A., to Rain Bird Sprinkler Mfg. Corporation. Rotary sprinkler. 3,677,472, Cl. 239-230.000.

Hartley Controls Corporation: *See*—
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Hartley, Nelson, to Hartley Controls Corporation. Rebound pug mill. 3,677,523, Cl. 259-69.000.

Hartman, Charles W., to United States of America, Atomic Energy Commission. Plasma heating and densification in axisymmetric toroidal plasma confinement devices. 3,677,890, Cl. 176-5.000.

Hartman, Raymond G., to GTE Sylvania Incorporated. Miniature indexing mechanism. 3,677,096, Cl. 74-527.000.

Hartman, Warren Emery; and Johnson, William Randall, to Worthington Foods, Inc. Fiber washing apparatus. 3,677,038, Cl. 68-20.000.

Hartmann, Heinrich: *See*—
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Harvey, Donald M., to Eastman Kodak Company. Compact film-pack camera. 3,677,160, Cl. 95-40.000.

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Hasegawa, Yoshisuke: *See*—
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Hashimoto, Saburo, to Union Oil Company of California. Alkane utilization in foam system. 3,677,895, Cl. 195-28.00r.

Hashirizaki, Sinya: *See*—
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Hassinger, Robert J., to Extracorporeal Medical Specialties, Inc. Removable catheter needle. 3,677,244, Cl. 128-214.400.

Hatagi, Hiroyuki; Kanamaru, Kenichi; and Funasaki, Yasuo, to Nippon Kokan Kabushiki Kaisha. Hollow conductor roll. 3,678,226, Cl. 191-1.00a.

Hatay, Charles. Method of equalizing supply of thread to a plurality of knitting stations. 3,677,036, Cl. 66-132.00r.

Hattori, Hiroyuki: *See*—

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Haug, Edward J., Jr., to United States of America, Army. Machine gun having a firing system means for obtaining substantially constant and minimum recoil forces. 3,677,135, Cl. 89-42.00b.
Haugwitz, Rudiger D.; and Lakshmi, Venkatachala, to Squibb, E. R., & Sons, Inc. Thiocyanic acid esters. 3,678,066, Cl. 260-309.200.
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Hauser-Lienhard, Hans Ulrich, to Bucher-Guyer AG Maschinenfabrik. Hay-making machine. 3,676,988, Cl. 56-1.000.
Hawthorne, William C. Apparatus and methods for feeding sheets of material from stacks with one side in vertical registration. 3,677,537, Cl. 271-29.000.
Hay, Donald A.: *See—*
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Haya Glass Works Limited: *See—*
Horikawa, Susumu; and Nakagawa, Kenshi, 3,677,785.
Hayakawa, Hideo, to Yugen Kaisha Tsukasa Sokken. Tandem-type hot-wire velocity meter probe. 3,677,085, Cl. 73-204.000.
Hayashi, Koichiro: *See—*
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Hayashi, Yoshiki; Sasaki, Hiromi; and Matsumura, Toichi, to Matsushita Electric Industrial Co., Ltd. Method for making electrically conducting layer of copper iodide. 3,677,816, Cl. 117-217.000.
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Hayes, John B.; and Knight, Bruce L., to Marathon Oil Company. Mobility control in flooding reservoirs containing water-sensitive clay minerals. 3,677,344, Cl. 166-252.000.
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Hedberg, Frederick L.; and Rosenberg, Harold, to United States of America, Air Force. Polychlorinated metallocenes and their synthesis. 3,678,088, Cl. 260-429.0cy.
Hedu, Jon, to Actmedia, Inc., mesne. Display device for nestable type shopping cart. 3,677,570, Cl. 280-33.99a.
Heers, Arthur F.; and Schmidt, William G., to Communications Satellite Corporation. Method and means for minimizing the subjective effect of bit errors on PCM-encoded voice communication. 3,678,389, Cl. 325-38.00r.
Hegler, Wilhelm. Apparatus for forming plastic tubing having a smooth inner wall and a corrugated outer wall. 3,677,676, Cl. 425-109.000.
Heinemann, Klaus: *See—*
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Heinonen, Russell M., Jr., to Technical Operations, Incorporated. Intermittent film pressure mechanism for cinematographic cameras. 3,677,629, Cl. 352-225.000.
Heneghan, Patrick J., to Teletype Corporation. Transition sensing circuit. 3,678,295, Cl. 307-235.000.
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Henrich, Werner. Apparatus for winding wire and the like. 3,677,483, Cl. 242-25.00r.
Henricot, Paul, to Societe Anonyme Usines Emile Henricot. Damping and control device for a bogie bolster. 3,677,363, Cl. 105-197.00d.
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Herckelbout, Jacques Pierre Albert, to Herckelbout et Fils. Spring grinding machines. 3,676,957, Cl. 51-118.000.
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MacDuff, Richard; and Stewart, Paul M., 3,677,530.
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Herdrich, William M.; and Bender, Norman A., to General Electric Company. Magnetizing apparatus and method. 3,678,436, Cl. 335-284.000.
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Herr, John A.; and Porter, Oswald M., to Singer Company, The. Electric scissors. 3,676,928, Cl. 30-228.000.
Herrick, Franklin W.: *See—*
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Herriott, Donald Richard; and Rawson, Eric Gordan, to Bell Telephone Laboratories, Incorporated. Focus and magnification adjustment of a high-performance camera. 3,677,651, Cl. 356-126.000.
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Herrmann, Pierre, to Compteurs Schlumberger. Infrared gas analyser. 3,678,262, Cl. 250-43.50r.
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Herterich, Walter; Probst, Georg; and Wurm, Bruno, to Ecofon Verkaufsgesellschaft Probst KG. Electrically operated typewriter. 3,677,386, Cl. 197-53.000.
Herterich, Walter; Probst, Georg; and Wurm, Bruno, to Ecofon Verkaufsgesellschaft Probst KG. Electric typewriter with printed circuit keyboard. 3,677,387, Cl. 197-98.000.
Herzhoff, Peter; Gref, Hans; Wolfgang, Leverkusen; Frenken, Hans; Assenmacher, Peter; and Westen, Dietmar, to Agfa-Gevaert Aktiengesellschaft. Method of measuring web tension. 3,677,076, Cl. 73-144.000.
Hessler, Henry M., 1/3 to Pazder, George J., Jr. and 1/3 to Rudkin, Alva James, Jr. Power hand saw. 3,677,313, Cl. 143-68.00f.
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Hewlett-Packard GmbH: *See—*
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Heynisch, Hinrich, to Siemens Aktiengesellschaft. Travelling wave tube having improved efficiency. 3,678,326, Cl. 315-3.600.
Hicks, Alan A., to Kohner Bros., Inc. Puzzle with multiple passageways having a common intersection and objects shiftable among said compartments. 3,677,547, Cl. 273-109.000.
Hicks, Glenn W. Faucet. 3,677,516, Cl. 251-174.000.
Higashide, Eiji: *See—*
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Higginbotham, Gordon John Spencer; and Hall, Douglas Wilson, to Rolls-Royce Limited. Method and apparatus for producing a metal article. 3,677,324, Cl. 164-60.000.
Higgins, Irwin R.; and Ferner, Jack D., to Chemical Separations Corporation. Split loop contactor. 3,677,937, Cl. 210-19.000.
Hill, Ira D.; Mikherjee, Barid B.; and Brown, Dale G., to Tenneco Chemicals, Inc. Allethronyl esters of certain cyclopropane-carboxylic acids as insecticides. 3,678,172, Cl. 424-306.000.
Hill, Richard L. Fishing lure. 3,676,948, Cl. 43-42.45.
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Hincz, Thomas W. Board game apparatus. 3,677,548, Cl. 273-130.00r.
Hino, John Bernhard; and Taub, Bernard, to Allied Chemical Corporation. Novel polyurethane-urea coating composition and cast film. 3,678,011, Cl. 260-75.0nh.
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Hirozawa, Koichiro; and Takahashi, Shigeo, to Aisin Seiki Kabushiki Kaisha. Mechano-hydraulically operated governor. 3,677,277, Cl. 137-54.000.
Hirsch, Nathan M. Apparatus for washing blood cells. 3,677,710, Cl. 23-258.500.
Hirschon, Jack M.; and Warner, Philip D., to TRW Inc. Semiconductor device and method of making the same. 3,678,346, Cl. 317-234.00r.
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Hodges, Peter Kinson, to Girling Limited. Liquid reservoirs. 3,678,232, Cl. 200-84.00c.
Hodgson, Jo. Wrist bands. 3,677,450, Cl. 224-4.00e.
Hoeflinger, Richard P.; and United States of America, Air Force, to Combined steady-state/dynamic total head probe. . 3,677,079, Cl. 73-147.000.
Hoffman, Harold Henry, to Bell Telephone Laboratories, Incorporated. Signal threshold crossing counter employing monostable multivibrator to suppress extraneous crossing indications. 3,678,396, Cl. 325-474.000.
Hoffmann-La Roche Inc.: *See—*
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Holyoake, Noel Victor; and Barr, David William. Forming of tubular metal ducting. 3,677,047, Cl. 72-50.000.
Holz, Emil, to Finckh, Hermann, Metalltuch-und Maschinenfabrik. Centrifugal classifier. 3,677,402, Cl. 209-270.000.
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Hooker Chemical Corporation: *See—*
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Horrom, Bruce W.; Crovetti, Aldo J.; and Viste, Kenneth L., to Rohm and Haas Company. Herbicidal 3,4,5-trisubstituted benzamides. 3,677,739, Cl. 71-118.000.
Horwath, Tibor G., to United States of America, Army. Flush mounted acoustic sensor. 3,678,453, Cl. 340-15.000.
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Hou, Kenneth C., to Celanese Corporation. Vapor phase boron deposition by pulse discharge. 3,677,799, Cl. 117-93.10r.
Houghton, Larry R., to Whirlpool Corporation. TV remote control system. 3,678,392, Cl. 325-392.000.
Houlihan, William J., to Sandoz-Wander, Inc. Dialkylaminomethylphenyl benzyl alcohols. 3,678,111, Cl. 260-570.000.
Hounshell, James R.; and Pringle, William L., to Pullman Incorporated. Flexible movable enclosure for vehicles. 3,677,197, Cl. 105-378.000.
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Huber-Emden, Helmut, to Ciba Limited. N-Acyl-3,4-dihydro-oxazine-(1,3) compounds for controlling phytopathogenic fungi. 3,678,046, Cl. 260-244.00r.
Huck, Rodney M.; and Le Blanc, John R., to Monsanto Company. Thermosettable aromatic amine formaldehyde resin compositions modified with an aromatic polycarboxylic compound. 3,678,008, Cl. 260-65.000.
Huck, Rodney M., to Monsanto Company. Aromatic amine-modified resole resins in combination with aromatic polycarboxylic compounds. 3,678,103, Cl. 260-51.500.
Hudson, Earl A., to Reliance Paper & Bag Co. Method and apparatus for manufacturing flat, tubular wrappers. 3,677,144, Cl. 93-1.00r.
Hudson, Leslie Gordon. Drawer units and runners therefor. 3,677,615, Cl. 312-346.000.
Hudson, Perry B., to American Chemosol Corporation. Tobacco additive device. 3,677,269, Cl. 131-134.000.
Huebotter, Paul R.; and Bump, Thomas R., to United States of America, Atomic Energy Commission. Fuel assembly for a liquid-metal-cooled fast breeder reactor. 3,677,893, Cl. 176-78.000.
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Irsay, Robert D., to Du Pont de Nemours, E. I., and Company. Pharmaceutical method and compositions employing substituted chromanone oximes and chromanone oxime ethers. 3,678,170, Cl. 424-283.000.
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Iwase, Hideo. Sewing machine for sewing patterns. 3,677,207, Cl. 112-118.000.
Iwashima, Hideo; and Fukao, Satoshi, to Brother Kogyo Kabushiki Kaisha. Keyboard switch assembly. 3,678,424, Cl. 335-206.000.
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Jeff, William C.; Luyster, Thomas, Jr.; Lynch, James F., Jr.; and Moroli, Frank A., to Armitage, John L., and Co. Textured articles and process for preparing same. 3,677,794, Cl. 117-45.000.
Jefferson, Donald E.; and Vermillion, Ronald G., to United States of America, Navy. Digital data storage system. 3,678,468, Cl. 340-172.500.
Jeffreys, George A. Live latic acid bacteria cultures and process of producing same. 3,677,897, Cl. 195-55.000.
Jenkinson, Richard D., to Union Carbide Corporation. Ethylene/acrylic acid copolymer emulsions. 3,677,989, Cl. 260-29.60h.
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Johnson, Harold Hector; South, Derek Bye; and White, Charles Victor Burdett, to Rotasign Limited. Display unit with radiation sensitive control. 3,678,282, Cl. 250-219.0fr.
Johnson, Harold M.; and Page, Russel D., to Caterpillar Tractor Co. Hydraulic motor grader blade lift, centershift control. 3,677,350, Cl. 172-789.000.
Johnson, Marvin M.; and Tabler, Donald C., to Phillips Petroleum Company. Molybdenum-antimony catalysts for hydrocarbon treating. 3,677,933, Cl. 208-109.000.
Johnson, Mary Zane. Liquid fuel and air mixture charge forming device. 3,677,529, Cl. 261-129.
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Johnson, Robert B., to Eastman Kodak Company. Film advancing device. 3,677,455, Cl. 226-49.000.
Johnson, Robert B.; and Kirn, Thomas G., to Eastman Kodak Company. Spindle assembly for web handling apparatus. 3,677,498, Cl. 242-207.000.
Johnson, Robert F.; and Lichodziejewski, Wieslaw, to Bell & Howell Company. Film sprocket hole sensing. 3,677,627, Cl. 352-109.000.
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Johnston, Reed H., to Veeder Industries, Inc., mesne. Computing device. 3,678,253, Cl. 235-92.0fl.
Joliot, Adolphe: *See—*
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Jones, Derrick A., to Minnesota Mining and Manufacturing Company. High reduction camera and locating apparatus. 3,677,161, Cl. 95-45.000.
Jones, John Ivor Parry, to United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the. Shaft angle transducers. 3,678,485, Cl. 340-177.00r.
Jones, Rexford W.; and Thompson, William B., to Staley, A. E., Manufacturing Company. Photographically producing molecularly dispersed dye images. 3,677,759, Cl. 96-48.000.
Jones, Richard Clive, to Lucas, Joseph, (Industries) Limited. Battery terminal clamp. 3,678,449, Cl. 339-225.000.
Jordan, Paul V.; Palmieri, John A.; and Wade, William T., to International Business Machines Corporation. Read only memory and method of using same. 3,678,475, Cl. 340-173.0sp.
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Joseph, Joseph Peter; Dusza, John Paul; and Bernstein, Seymour, to American Cyanamid Company. Estrogen glucosaminides of 2-aminoglucose. 3,678,029, Cl. 260-210.500.
Joynes, John L., to United States of America, Navy. Self activated fluidic control for a submerged towed body. 3,677,278, Cl. 137-81.500.
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Kadowaki, Tatsusuke, to Kabushiki Kaisha Ricoh. Movie projector for use with a film cartridge or reel. 3,677,624, Cl. 352-73.000.
Kaempen, Charles E. Composite structure. 3,677,432, Cl. 220-3.000.
Kai, Tsunetoshi; Hagihara, Takeaki; and Ishido, Teruhisa, to Asaki Kasei Kogyo Kabushiki Kaisha. Photopolymerizable diisocyanate modified unsaturated polyester containing acrylic monomers. 3,677,920, Cl. 204-159.150.

Kail, John Alan Elliott, to Imperial Chemical Industries Limited. Antistatic thermoplastic polymer film. 3,677,811, Cl. 117-138.80e.

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Kaiser, Wolfgang; Nitzsche, Siegfried; Wohlfarth, Ernst; and Hittmair, Paul, to Wacker-Chemie G.m.b.H. Room temperature vulcanizable silicone rubber containing polyglycol derivative. 3,677,996, Cl. 260-46.50g.

Kaiser, Wolfgang; Nitzsche, Siegfried; Wohlfarth, Ernst; Strasser, Alois; and Hittmair, Paul, to Wacker-Chemie G.m.b.H. Bouncing putties. 3,677,997, Cl. 260-33.2sb.

Kaiser, Wolfgang; Nitzsche, Siegfried; Wohlfarth, Ernst; and Hittmair, Paul, to Wacker-Chemie G.m.b.H. Room temperature vulcanizable silicone elastomer stocks. 3,678,003, Cl. 260-46.50g.

Kajiwara, Tokuji. Mixer. 3,677,100, Cl. 74-660.000.

Kalb, John W., to Ohio Brass Company, The. Lightning arrester and gap unit therefor. 3,678,340, Cl. 317-61.000.

Kalfaian, Meguer V. Bandwidth compression system in phonetic sound spectrum. 3,678,201, Cl. 179-1.0sa.

Kalnin, I. L.; and Breckenridge, G. J., to Celanese Corporation. Moldable needle-like assemblies. 3,677,804, Cl. 117-100.00a.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to Societe anonyme dite: L'Oreal. Dyeing human hair with aqueous solution of indamines. 3,677,690, Cl. 8-10.000.

Kalopissis, Gregoire; Abegg, Jean-Louis; Ghilardi, Guiliana; and de Beaulieu, Henri Philippe, to Societe Anonyme dite: L'Oreal. Hair treatment compositions containing polycondensable compounds. 3,678,157, Cl. 424-71.000.

Kamata, Masamoto: *See—*
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Kamenir, Melvin; and Burridge, Robert E., to Litton Business Systems, Inc. Handheld transducer operational state and directional indicator. 3,678,218, Cl. 179-100.20c.

Kanamaru, Kenichi: *See—*
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Kanegafuchi Boseki Kabushiki Kaisha: *See—*
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Kaneko, Hisashi, to Bell Telephone Laboratories, Incorporated. Segment analog-to-digital or digital-to-analog converter. 3,678,504, Cl. 340-347.0da.

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Kaplan, Sam H., to Zenith Radio Corporation. Screening a black-surround color cathode-ray tube. 3,677,758, Cl. 96-36.100.

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Kasano, Hiroyuki; and Kawamura, Masao, to Hitachi, Ltd. Solid state electronic device utilizing difference in effective mass. 3,678,302, Cl. 307-299.000.

Katagiri, Yoshiharu: *See—*
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Kathawala, Faizulla G., to Sandoz-Wander, Inc. Treatment of inflammation with 1,2,3-benzotriozin-4 (3H)-ones. 3,678,166, Cl. 424-246.000.

Katsman, Berta Osipovna: *See—*
Maximovich, Boleslav Ivanovich; Dudko, Daniil Andreevich; Agafonov, Nikolai Georgievich; Maximov, Igor Petrovich; Andreev, Vadim Grigorievich; Lepilov, Nikolai Yakovlevich; Svinov, Alexei Kapitonovich; Slonimsky, Alexandr Borisovich; Volk, Boris Zakharovich; Gubin, Alexandr Ivanovich; and Katsman, Berta Osipovna, 3,677,330.

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Kawai, Masanobu, to Kyowa Hakko Kogyo Kabushiki Kaisha. Process for producing cellulase. 3,677,899, Cl. 195-66.00r.

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Kawashima, Nobuki, to University of Tokyo, President. Diaphragmless radioactive radiation counter. 3,678,274, Cl. 250-83.60r.

Kayser, Emil J. Method of making pile weatherstripping. 3,677,851, Cl. 156-73.000.

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Keith, Carl D.; Haley, Alfred J., Jr.; and Kero, Robert M., to Engelhard Minerals & Chemicals Corporation. Method of making an electrolytic anode. 3,677,815, Cl. 117-215.000.

Keith, Frederick Walter, Jr., to Pennwalt Corporation. Liquid and sludge treatment. 3,677,405, Cl. 210-71.000.

Keller, Hans, to ITT Industries, Inc. Monolithic integrable flip flop circuit. 3,678,300, Cl. 307-288.000.

Keller, Joseph H., Jr.; and Sterner, Russell L., to Grove Manufacturing Company. Mounting assembly for installation of hydraulic jacks on outrigger. 3,677,417, Cl. 212-145.000.

Kellert, Paul H. Modular building construction and method. 3,676,973, Cl. 52-262.000.

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Kemp, Jacob D., to Chevron Research Company. Process for the esterification of isobutene. 3,678,099, Cl. 260-497.00r.

Kendall, Giles Arthur; and Minick, Robert, to Menasco Manufacturing Company. Tactical cargo hook. 3,677,507, Cl. 244-137.000.

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Kendall, Jerry A., to Elfab Corporation. Method for manufacturing connector terminals. 3,676,926, Cl. 29-625.000.

Keniston, John W. Pincers. 3,677,112, Cl. 81-43.000.

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Kenwell, Edward Albert. Book support for the physically infirm. 3,677,510, Cl. 248-441.000.

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Kershner, Carl J.: *See—*
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Kery, Ervin, to Enger Kress Company. Ladies. 3,677,317, Cl. 150-28.00r.

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Kian, Leonard. Safety clasp construction. 3,676,903, Cl. 24-265.000.

Kidd, Thomas L., Jr.; and McClain, Albert D., Jr., to General Electric Company. Non-flammable, thin, integrally illuminated control panel overlay. 3,676,943, Cl. 40-130.00m.

Kidde, Walter, & Company, Inc.: *See—*
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Kienzler, Eberhard, to Siemens Aktiengesellschaft. Method for the digital conversion of an analog value with the extended counting process. 3,678,502, Cl. 340-347.0nt.

Kihara, Nobutoshi, to Sony Corporation. Counter for a tape record/playback mechanism. 3,678,215, Cl. 179-100.20e.

Kihara, Nobutoshi, to Sony Corporation. Withdrawing a magnetic recording tape from a cassette and engaging a loop formed in the tape with the guide drum of a magnetic recording and/or reproducing apparatus. 3,678,217, Cl. 179-100.20t.

Kilduff, Timothy J., to United States of America, Army. Multi-purpose conductive adhesive. 3,677,974, Cl. 252-514.000.

Kimberly-Clark Corporation: *See—*
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Sager, Karl E., 3,677,854.
Sokolowski, Robert C., 3,677,858.

Kimmel, Albert L., to Butler Manufacturing Company. Texture coating composition of polyvinyl acetate emulsion, asbestos and Portland cement. 3,677,988, Cl. 260-29.60s.

Kimura, Yoshito: *See—*
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King, Charles W., to General Mills, Inc. Multi-textured and patterned doughs. 3,677,769, Cl. 99-86.000.

King, Colin F., to Dunlop Holdings Limited. Pressure reducing devices. 3,677,300, Cl. 138-42.000.

King, James A.; and Maxam, David R., to Stauffer Chemical Company. Filter aid slurry metering process. 3,677,406, Cl. 210-75.000.

King, James L.; and Arrington, Lee O., to Eastman Kodak Company. Photographic printing apparatus. 3,677,641, Cl. 355-83.000.

King, James Robert; and Myers, Gerald D., to King Nutronics Corporation. Parachute actuator testing apparatus. 3,677,062, Cl. 73-4.00r.

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King, William H., Jr.; and Dietz, Walter A., to Esso Research and Engineering Company. Method for preconditioning piezoelectric sorption detectors. 3,677,066, Cl. 73-23.000.

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Kinnicutt, Roger, Jr. Self-tailing portable capstan. 3,677,521, Cl. 254-183.000.

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Kintner, Paul M., to Cutler-Hammer, Inc. Storage courier boundary control system. 3,677,421, Cl. 214-16.40a.

Kirkpatrick, Milton E., to TRW Inc. Annular heat pipe. 3,677,329, Cl. 165-105.000.

Kirkpatrick, Truman; and Nilles, James Jacob, to Sherwin-Williams Company, The. Calcined molybdated zinc oxide pigments and method of preparation thereof. 3,677,783, Cl. 106-292.000.

Kirn, Thomas G.: *See—*
Johnson, Robert B.; and Kirn, Thomas G., 3,677,498.

Kirsch, Donald L.: *See—*
Wright, Peter C.; and Kirsch, Donald L., 3,677,365.

Kirschey, Gerhard. Coupling operating by centrifugal force. 3,677,380, Cl. 192-105.0ba.

Kissell, Kenneth E.: *See—*
Macknik, Louis S.; and Kissell, Kenneth E., 3,678,279.

Kitaigorodskaya, Evgenya Antonova: *See—*
Kitaigorodsky, Isaak Iljich, 3,677,728.

Kitaigorodsky, Isaak Iljich; deceased (by Kitaigorodskaya, Evgenya Antonova; administrator). Method of manufacturing crystalline-glass articles. 3,677,728, Cl. 65-19.000.

Kitanosono, Tatsushi; Mashimo, Yukio; and Takishima, Yoshiyuki, to Canon Kabushiki Kaisha. DC motor control apparatus. 3,678,354, Cl. 318-294.000.

Kitchens, Garry C.; Hochstetler, Alan R.; and Kaiser, Kent, to Givaudan Corporation. Acid isomerization of chamigrenes. 3,678,119, Cl. 260-666.0py.

Kiyomitsu, Eto: *See—*
Nishi, Seiya; Oshio, Akira; and Kiyomitsu, Eto, 3,677,780.

Kizielewski, Edward T.: *See—*
O'Neal, Donald V.; and Kizielewski, Edward T., 3,677,630.

Klanderman, Bruce H.; and Faber, Jan W. H., to Eastman Kodak Company. 9,10-Bridged anthracene compounds. 3,678,072, Cl. 260-326.50b.

Klanke, Charles E. Adjustable pipe coupling. 3,677,580, Cl. 285-184.000.

Klapprott, David K.; and Paradis, Daniel L., to Dexter Corporation, The. Adhesive compositions containing epoxy resin, carboxy containing copolymer and 1,5-dihydrozynaphthalene. 3,678,130, Cl. 260-837.000.

Klapprott, David K.; and Paradis, Daniel L., to Dexter Corporation, The. Adhesive compositions containing epoxy resin, carboxyl containing copolymer and 2,2- bis-(4-hydroxyphenyl) sulfone. 3,678,131, Cl. 260-837.00r.

Klas, Gunther: *See—*
Gottweis, Gert; Herrlich, Michael; Klas, Gunther; Schober, Joachim; Thiede, Peter; and Zachaus, Eberhard, 3,676,978.

Klausing, Melvin H., to Combustion Engineering, Inc. Setting gage for multiple head tool holder. 3,676,935, Cl. 33-185.00r.

Klein, Robert I., to Coulter Electronics, Inc. Malfunction detection circuit and method. 3,678,382, Cl. 324-140.00r.

Klein, Stanley R. Disposable litter package having a scraping blade. 3,676,887, Cl. 15-104.800.

Klement, Gunter, to Henkel & Cie G.m.b.H. Process for the coating of filament bodies with an adhesive for metal and rubber. 3,677,809, Cl. 117-119.600.

Kletecka, George; and Smith, Peter D., to Goodrich, B. F., Company, The. Alkylhydroxyphenylcarboalkoxy-substituted isocyanurates. 3,678,047, Cl. 260-248.0ns.

Klingler, George A. Apparatus for accumulating and displaying fine particles in a gas. 3,677,650, Cl. 356-103.000.

Klopfer, Oskar E. H., to Ethyl Corporation. Nuclearly alkylated aniline recovery process. 3,678,113, Cl. 260-578.000.

KMS Industries, Inc.: *See—*
Burzan, Vernon J., 3,677,639.
Hall, William D.; and Shaefer, Lewis H., 3,677,223.
Hall, William D.; and Burzan, Vernon J., 3,677,623.
Lee, Charles K.; and Burzan, Vernon J., 3,677,154.

Knauf, Nicholas T., to Kimberly-Clark Corporation. Apparatus for pleating and ultrasonically sealing sanitary napkin tab ends. 3,677,861, Cl. 156-380.000.

Kneeland, David. Coupling. 3,677,033, Cl. 64-28.00r.

Knight, Bruce L.: *See—*
Hayes, John B.; and Knight, Bruce L., 3,677,344.

Knoll International, Inc.: *See—*
Morrison, Andrew Ivar; and Hannah, Bruce R., 3,677,601.

Knopf, Robert J.: *See—*
Brotherton, Thomas K.; Lynn, John W.; and Knopf, Robert J., 3,677,983.

Knowles, Frederick G.; and Taylor, Clarence R., to Eastman Kodak Company. Apparatus for storing strip material. 3,677,487, Cl. 242-71.200.

Knowles, Richard N., to Du Pont de Nemours, E. I., and Company. Process for strong, durable press fabrics. 3,677,802, Cl. 117-56.000.

Knowles, Richard N., to Du Pont de Nemours, E. I., and Company. Certain cyclohexylformamidines. 3,678,109, Cl. 260-564.00r.

Knowles, Richard N., to Du Pont de Nemours, E. I., and Company. Irritant composition comprising certain cyclohexylcarbamates. 3,678,171, Cl. 424-300.000.

Kobayashi, Hidehiko: *See—*
Fukuma, Noboru; Kobayashi, Hidehiko; Matsui, Kenichi; Sakashita, Masahira; and Henmi, Hiroshi, 3,677,880.

Koch, Charles Peter, to Monarch Western Equipment Ltd. Surface automobile conveyor. 3,677,190, Cl. 104-172.

Koch, Kenneth F.: *See—*
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Koch, Louis, to Kohnstamm, H., & Co., Inc. Non-toxic dyes in polyglycerol fatty acid ester and glycol or glycerine and its mixture therein. 3,677,691, Cl. 8-41.

Kocher, Robert C.; Moore, Franklin K.; Samelson, Harold; and Watson, William R., to GTE Laboratories Incorporated. Transverse flow laser cell. 3,678,410, Cl. 331-94.500.

Koehler, Rudolph. Electrical lamp socket. 3,678,443, Cl. 339-119.00l.

Koehring Company: *See—*
Brown, Gaylord W., 3,677,675.

Koerner, Gotz; and Rossmy, Gerd, to Th. Goldschmidt A.G. Process for breaking petroleum emulsions. 3,677,962, Cl. 252-345.000.

Koerner, Roger J.: *See—*
Childers, Thomas W.; Burkhardt, Joseph A.; and Koerner, Roger J., 3,677,001.

Kohner Bros., Inc.: *See—*
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Kohnstamm, H., & Co., Inc.: *See—*
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Kojima, Katsumi: *See—*
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Kokx, Darrel D., to Procter & Gamble Company, The. Arcuately shaped sanitary napkin and method of formation. 3,677,249, Cl. 128-290.000.

Kolar, Charles Wesley, Jr., to Ralston Purina Company. Process for the manufacture of caramels. 3,677,771, Cl. 99-134.00r.

Kolatorowicz, Edwin E., to General Electric Company. Brushless DC adjustable speed drive with static regenerative DC motor control. 3,678,358, Cl. 318-254.000.

Kolb, Dieter, to Lestra AG. Pressure measuring device. 3,677,090, Cl. 73-420.000.

Kolb, Karl Heinz: *See—*
Laurent, Henry; Kolb, Karl Heinz; and Wiechert, Rudolf, 3,678,034.

Kolb, Robert Herrick: *See—*
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Koleszar, Frank: *See—*
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Komori, Shigehiro; and Hattori, Hiroyuki, to Canon Kabushiki Kaisha. Device for automatically regulating the concentration of developing solution. 3,677,222, Cl. 118-7.

Konishiroku Photo Industry Co., Ltd.: *See—*
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Konkel, Joseph: *See—*
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Kooi, Else: *See—*
Tulp, Theodorus Joannes; Appels, Johannes Arnoldus; and Kooi, Else, 3,678,347.

Kooi, Else, to U.S. Philips Corporation, mesne. Semiconductor device comprising an insulated gate field effect transistor and method of manufacturing the same. 3,676,921, Cl. 29-571.000.

Koomey, Paul C., to Stewart, C. Jim, & Stevenson, Inc. Safety apparatus for drilling rig. 3,677,520, Cl. 254-173.000.

Koono, Takehiko: *See—*
Naka, Jinshichi; Tokuda, Yasunori; Koono, Takehiko; and Utsugi, Jun, 3,677,773.

Kopanda, Joseph E.: *See—*
Nickelsen, Hubert O.; Kopanda, Joseph E.; and Piasecki, Felix J., 3,677,781.

Kopera, Anthony, to Bowles Fluidics Corporation. Interruptible jet sensor. 3,677,276, Cl. 137-14.000.

Koppers Company, Inc.: *See—*
Carlson, John David, 3,677,878.

Korenicki, William John: *See—*
Masson, Narinder; Korenicki, William John; and Lechner, Walter Ludwig, 3,677,084.

Korn, Joseph: *See—*
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Korner, Peter: *See—*
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Korsnas-Marma Aktiebolag: *See—*
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Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tkach, Khai Berkovich; and Chepurnoi, Nikolai Prokhorovich. Device for stabilizing the course of the tunnelling element. 3,677,354, Cl. 175-76.000.

Kot, Vladimir Ivanovich: *See—*
Scherban, Alexandr Nazarievich; Furman, Neonil Izrailevich; Sotnichenko, Boris Feodosievich; Belogolovin, Nikolai Stefanovich; Chopovsky, Jury Ivanovich; Sutormin, Jury Nikolaevich; Zaitsev, Valentin Ivanovich; Kot, Vladimir Ivanovich; Mikhailjuk, Nikolai Tarasovich; Denisenko, Sergei Andreevich; Chaschinov, Anatoly Vasilievich; Shaporev, Stepan Vasilievich; and Samoilenko, Svetlana Mikhailovna, 3,678,489.

Kothmann, Gilbert C. Safety trailer hitch. 3,677,564, Cl. 280-457.

Koutz, Stanley L., to Gulf Oil Corporation. Energy storage system and method. 3,677,008, Cl. 60-59.00t.

Kraft, Joseph K.: *See—*
Boltrek, Henry; and Kraft, Joseph K., 3,677,388.

Krapcho, John, to Squibb, E. R., & Sons, Inc. Benzamide derivatives. 3,678,052, Cl. 260-268.00r.

Krauer, Werner; and Martinelli, Alfred, to Polymetron Ltd. Apparatus for changing tubes in peristaltic pumps. 3,677,577, Cl. 285-137.000.

Krause, Erich, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Flat knitting machine with automatic transfer device. 3,677,037, Cl. 66-147.000.

Kremp, Rudolf; and Winkler, Alfred, to Agfa-Gevaert Aktiengesellschaft. Photographic apparatus for making exposures in accordance with the carrier frequency method. 3,677,147, Cl. 95-1.00r.

Kresse, Franklin T.: *See—*
Cohrs, Arthur H.; and Kresse, Franklin T., 3,676,941.

Krost, Eleanor Burditt: *See—*
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Kroy, Walter: *See—*
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Kuga, Naoyoshi: *See—*
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Kuhn, Max: *See—*
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Kuhn, Peter: *See—*
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Kumashiro, Izumi: *See—*
Yamazaki, Akihiro; Furukawa, Teruo; and Kumashiro, Izumi, 3,678,030.

Kupfmuller, Karl, to ITT Industries, Inc. Method of producing a voltage equal to the speed of road vehicles. 3,677,094, Cl. 73-503.000.

Kurasawa, Kazuo: *See—*
Akuta, Tomohiko; Honsyo, Yoshi; Hashirizaki, Sinya; Hiruma, Teruo; and Kurasawa, Kazuo, 3,678,192.

Kurebayashi, Tokuhiro: *See—*
Oishi, Kazuo; Kurebayashi, Tokuhiro; Ando, Noriyoshi; Yamamoto, Noboru; and Yoshida, Hiroshi, 3,677,253.

Kurichh, Sham: *See—*
Davis, Dennis J.; Sudnick, Dennis J.; Juhasz, John E.; and Kurichh, Sham, 3,677,609.

Kurimuto, Masashi; Sugimoto, Kaname; and Hirao, Mamoru, to Hayashibara Company. Process for preparing crystalline maltose. 3,677,896, Cl. 195-31.00r.

Kurita Water Industries Ltd.: *See—*
Fujimoto, Hiroshi; and Fukuda, Mitsugu, 3,677,940.

Kuroda, Takaji, to Nippon Electric Company, Limited. Multiple port hybrid circuit. 3,678,415, Cl. 333-9.000.

Kurokawa, Hiromichi, to Sony Corporation. Index signal generating apparatus for single tube camera. 3,678,184, Cl. 178-5.4st.

Kvaerner Brug: *See—*
Bognaes, Ragnar; and Solberg, Olav, 3,677,021.

Kwake, John P., to Kydar Company, The. Inflatable enclosure for swimming pools and the like. 3,676,880, Cl. 4-172.120.

Kydar Company, The: *See—*
Kwake, John P., 3,676,880.

Kyowa Hakko Kogyo Kabushiki Kaisha: *See—*
Kawai, Masanobu, 3,677,899.

Kyser, Leslie T., to Singer Company, The, mesne. Asynchronous logic for determining number of leading zeros in a digital word. 3,678,259, Cl. 235-156.000.

La Barge, Robert L., to Aluminum Company of America. Nipple assembly and package. 3,677,429, Cl. 215-11.00c.

La Corre, Yvette Marie Laurence: *See—*
Dupieux, Jacques Georges; Gadre, Jean-Claude; Le Corre, Jean-Pierre; and Loisel, Jean Francois Pierre Julien, 3,678,206.

La Croce, John Matthew. Milking assistance device. 3,677,232, Cl. 119-146.000.

La Roe, Emmett T., to McDonnell Douglas Corporation. Store rack hook assembly. 3,677,506, Cl. 244-137.000.

La Salle Machine Tool, Inc.: *See—*
Lamb, Donald P., 3,677,383.
Skrentner, James A., 3,677,115.

La Telemecanique Electrique: *See—*
Santerre, Fernand; and Libaud, Francis, 3,676,990.

La Vanchy, Wayne N. Connections for conditioned air ducts. 3,677,579, Cl. 285-169.000.

Laakso, Thomas M.: *See—*
Ford, John A., Jr.; McConkey, Robert C.; and Laakso, Thomas M., 3,677,754.

Labatt, John, Limited: *See—*
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LaBaw, Kenneth B., to United States of America, Navy. Radiation sensitive optical tracker. 3,678,283, Cl. 250-216.000.

Laboratorios del Dr. Esteve, S.A.: *See—*
Esteve, Antonio; and Espinos, Jose M., 3,678,040.

Laboratorios Espinos y Bofill S.A.: *See—*
Esteve, Antonio; and Espinos, Jose M., 3,678,040.

Ladney, Michael, Jr.: *See—*
Best, William J., 3,677,792.

Lagerqvist, Roger; and Stenlund, Stig, to Monsun-Tison AB. Device in fluid-containing cylinders having a fluid-operated piston. 3,677,141, Cl. 91-394.000.

Lakner, Endre: *See—*
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Lakshmi, Venkatachala: *See—*
Haugwitz, Rudiger D.; and Lakshmi, Venkatachala, 3,678,066.

Lamb, Donald P., to La Salle Machine Tool, Inc. Part meter. 3,677,383, Cl. 193-35.00a.

Lampi, Rauno A.; Hu, Kwoh H.; and Osborne, Richard F., to United States of America, Army. Infrared radiometric detection of seal defects. 3,678,276, Cl. 250-83.30h.

Landenberger, Helmut: *See—*
Wiederhut, Wolfgang; Landenberger, Helmut; and Hofmann, Ulrich, 3,677,035.

Landrum, Bobby L., to Northrop Corporation. Multi-beam electron beam scanner utilizing a modulation plate for modulating each of the beams independently. 3,678,330, Cl. 315-13.00r.

Landrum, Ralph A., Jr.: *See—*
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Lang, Robert A.: *See—*
Pickett, Charles G.; Lang, Robert A.; and Comers, Robert C., 3,677,866.

Lang, Robert A., to Bio-Medical Sciences, Inc. Disposable type thermometer. 3,677,088, Cl. 73-356.000.

Lapointe, Lloyd J.; and Voegelin, Howard J., to Veeder Industries Inc. Counter mechanism. 3,677,468, Cl. 235-144.0pn.

Laprade, Bernard: *See—*
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Laprade, Bernard assor. to: *See—*
Gele, Pierre; and Laprade, Bernard, 3,677,241.

Larmurier, Claude Fernand Emile, to Compagnie des Compteurs. Fluidic-pneumatic devices with forces balancing. 3,677,078, Cl. 73-141.00r.

Larson, Harold A.: *See—*
Anzelone, Thomas A., Jr.; Larson, Harold A.; and Stricker, Alfred A., 3,677,853.

Larson, Howard M. Foldable crawler. 3,677,569, Cl. 280-32.600.

Last, Anthony Graham Marshall, to Imperial Chemical Industries Limited. Foamed polyolefin films. 3,677,980, Cl. 260-2.5ha.

Lauerer, Albert: *See—*
Bergmeyer, Hans Ulrich; Naher, Gotthilf; Thum, Waldemar; Lauerer, Albert; and Emmer, Rudolf, 3,677,901.

Laurent, Henry; Kolb, Karl Heinz; and Wiechert, Rudolf, to Schering Aktiengesellschaft. 2-Chloro-$\Gamma^{1,4}$-steroids. 3,678,034, Cl. 260-239.550.

Lawless, William N., to Corning Glass Works. Technique for flux growth of barium titanate single crystals. 3,677,718, Cl. 23-301.00r.

Lawrence, John S., to Browning Arms Company. Ski-binding heel mechanism. 3,677,566, Cl. 280-11.35t.

Lawrenson, Thomas, to British Insulated Callender's Cables Limited. Telecommunication cables. 3,678,177, Cl. 174-113.00c.

Laws, Peter. Change-over valves. 3,677,291, Cl. 137-554.000.

Le Blanc, John R.: *See—*
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Le Coq, Daniel France, to North American Philips Company, Inc. Camera tube targets. 3,677,833, Cl. 148-33.200.

Le Corre, Jean-Pierre: *See—*
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Le Creurer, Maurice: *See—*
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Le Guen, Henri: *See—*
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Le Page, Madeleine A.; and De Vries, Albert J., to Produits Chimiques Pechiney-Saint-Gobain. Chromatographic separation with porous silica. 3,677,938, Cl. 210-31.000.

Le Van, James O.: *See—*
Bergey, John M.; Le Van, James O.; Walton, Richard S.; and Brethauer, Louis G., 3,676,993.

Le Van, Wayne P. Apparatus for cooking strips of meat. 3,677,171, Cl. 99-339.000.

Lear Siegler, Inc.: *See—*
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Leas Brothers Development Corporation: *See—*
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Leas, Lawrence E.; Leas, Robert L.; and Johnson, Cecil J., to Leas Brothers Development Corporation. High temperature heat generator. 3,677,204, Cl. 110-1.000.

Leas, Robert L.: *See*—
Leas, Lawrence E.; Leas, Robert L.; and Johnson, Cecil J., 3,677,204.

Lechleider, Joseph William: *See*—
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Lechner, Walter Ludwig: *See*—
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Ledgett, Lowell Ashton, to Colgate-Palmolive Company. Porous ring feed head. 3,677,714, Cl. 23-285.000.

Lee, Charles K.; and Burzan, Vernon J., to KMS Industries, Inc. Card and holder for fingerprint identification system. 3,677,154, Cl. 95-1.100.

Lee, Kenneth M.: *See*—
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Leesona Limited: *See*—
Mc Kenzie, John, 3,677,482.

Lehigh University: *See*—
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Lehnert, Gunter: *See*—
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Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. Derivatives of 1,6-phenazinediol 5,10-dioxide. 3,678,051, Cl. 260-267.000.

Leitz, Ernst, G.m.b.H.: *See*—
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Werner, Nickel; and Nikolaos, Christopoulos, 3,677,151.

Lenfant, Henri. Automatic gas-trap. 3,677,279, Cl. 137-197.000.

Lennox, Thomas H., to Arc-O-Vec, Inc. Heater element. 3,678,249, Cl. 219-544.000.

Leonard, James L. Cathode ray tube having standby cathode assembly on rotatable support. 3,678,324, Cl. 313-236.000.

Lepilov, Nikolai Yakovlevich: *See*—
Maximovich, Boleslav Ivanovich; Dudko, Daniil Andreevich; Agafonov, Nikolai Georgievich; Maximov, Igor Petrovich; Andreev, Vadim Grigorievich; Lepilov, Nikolai Yakovlevich; Svinov, Alexei Kapitonovich; Slonimsky, Alexandr Borisovich; Volk, Boris Zakharovich; Gubin, Alexandr Ivanovich; and Katsman, Berta Osipovna, 3,677,330.

Les Fabriques d'Assortiments Reunies: *See*—
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Les Usines Laprade S.A.: *See*—
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Lestra AG: *See*—
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Lev, Edward R. Indicator for automobiles. 3,678,457, Cl. 340-107.000.

Lever Brothers Company: *See*—
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Copier, Harald; and Tonsbeek, Christiaan Herman Theodoor, 3,678,064.

Levey, Richard S. Cycle theft alarm. 3,678,455, Cl. 340-63.000.

Levin, Alfred A.: *See*—
Richter, Sidney B.; and Levin, Alfred A., 3,677,735.

Levy, Joseph; and Psihas, James, to Universal Oil Products Company. Preparation of tertiary aminoalkyl derivatives of substituted acetohydroxamic acid esters. 3,678,048, Cl. 260-247.20b.

Lewis, Donald R., to Shell Oil Company. Method of measuring the abrasiveness of an abrasive fluid. 3,678,273, Cl. 250-83.00r.

Lewis, George Stanley: *See*—
Perrin, Alfred J.; Dell John D.; Evans, David B.; and Lewis, George Stanley, 3,677,339.

Lewis, Richard L., to Bendix Corporation, The. Adaptive braking system with hydraulically powered modulator. 3,677,608, Cl. 303-21.00f.

Lewis, Robert W., to Battelle Development Corporation, mesne. Reduced noise high resolution holographic imaging using spatially incoherent reconstructing radiation. 3,677,616, Cl. 350-3.500.

Lewis, Sheldon N.; Merritt, Richard F.; and Emmons, William D., to Rohm and Haas Company. Unsaturated quaternary monomers and polymers. 3,678,098, Cl. 260-89.500.

Lewis Spring & Manufacturing Co.: *See*—
Strzepek, Edward S., 3,677,054.

Leyrat, Pierre J., to Societe Anonyme Poclain. Hydraulic control for hydraulic bucket having reciprocating teeth. 3,677,604, Cl. 299-67.000.

Li, Pei Ching: *See*—
Ali, Mir Akbar; Schwartz, Murray A.; and Li, Pei Ching, 3,677,778.

Libaud, Francis: *See*—
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Lichtman, Irwin A.; and Rosengart, Abraham M., to Diamond Shamrock Corporation. Defoamer composition and method of preparation. 3,677,963, Cl. 252-358.000.

Lilley, G. C.; and Kolb, Robert Herrick, to Shell Oil Company. Method and apparatus for determining the volumetric average of a parameter. 3,678,257, Cl. 235-151.340.

Lilly, Herbert J., Jr.: *See*—
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Lincoln Tool & Manufacturing Co.: *See*—
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Lindqvist, Karl Sigvard, to Combitainer S.A. Arrangement in loading pallets supporting walls. 3,677,199, Cl. 108-56.

Lindqvist, Lars-Hakan. Life saving implements. 3,676,882, Cl. 9-14.000.

Lindsjo, Olle: *See*—
Bryk, Petri; Haani, Martti; Honkasalo, Jorma B.; Kinnunen, Jorma; Lindsjo, Olle; Nyholm, Erik; Poijarvi, Jaakko; Rastas, Jussi; and Kangas, Juhani, 3,677,696.

Lindy, Lowell B., to Dow Chemical Company, The. Method of bleaching sulfonate surfactants. 3,677,952, Cl. 252-94.000.

Link, Manfred, to Triumph Werke. Mechanism for positioning single element type carriers. 3,677,384, Cl. 197-16.000.

Linkletter, Robert P. Spout-type safety dispensing cap. 3,677,445, Cl. 222-153.000.

Lion Fat & Oil Co., Ltd.: *See*—
Tanaka, Ryohei, 3,677,821.

Liss S.A.: *See*—
Blosch, Walter, 3,677,793.

Lithium Corporation of America: *See*—
McElroy, Bobby Joe; and Merkley, Joseph Herbert, 3,678,121.

Little, John C., to GTE Sylvania, Incorporated. Fluid analyzer apparatus. 3,677,652, Cl. 356-183.000.

Litton Business Systems, Inc.: *See*—
Kamenir, Melvin; and Burridge, Robert E., 3,678,218.

Litton Systems, Inc.: *See*—
Rose, Marion S., 3,678,409.

Liu, Gordon Y. T.; and Strange, Carl P., to Dow Chemical Company, The. Crosslinking of ethylene polymers without a crosslinking agent. 3,678,024, Cl. 260-94.9ga.

Ljungkull, Gunnar R.; and Johnson, Robert H., to Minnesota Mining and Manufacturing Company. Directional signal having refractive indicant areas. 3,678,458, Cl. 340-107.000.

Lloyd, Samuel H.; and Santa Fe International Corporation, to Blowout prevention apparatus for subaqueous drilling. . 3,677,352, Cl. 175-7.000.

Lochman, Harry E.: *See*—
Dinenno, Philip A., Jr.; Bonk, Joseph S.; Conrad, Kenneth C.; Moore, Rodney S.; Lochman, Harry E.; and Torello, Daniel D., 3,677,658.

Lodding Engineering Corporation: *See*—
Pezaris, Constantine Demetrius; and Pantazelos, Theophanes G., 3,677,831.

Loeffel, Emil. Self-storing fire escape ladder. 3,677,366, Cl. 182-70.000.

Lohse, Friedrich: *See*—
Schmid, Rolf; Lohse, Friedrich; and Batzer, Hans, 3,678,127.

Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans, to Ciba-Geigy AG. Thermocurable crystalline polyurethanes based on branched polyesters. 3,678,009, Cl. 260-75.0np.

Loisel, Jean Francois Pierre Julien: *See*—
Dupieux, Jacques Georges; Gadre, Jean-Claude; Le Corre, Jean-Pierre; and Loisel, Jean Francois Pierre Julien, 3,678,206.

Lombardi, Luigi, to Pirelli Societa per Azioni. Medium voltage cables. 3,677,849, Cl. 156-53.000.

Lonadier, Frank D.; and Kershner, Carl J., to United States of America, Atomic Energy Commission. Radioactive heat source. 3,677,958, Cl. 252-301.00r.

Long, Eric L., to Cherry Electrical Products Corporation. Mechanical key lock-in. 3,678,255, Cl. 235-145.00r.

Long Manufacturing Co., Inc.: *See*—
Atkinson, Wallace E., 3,677,042.

Longhi, Giuseppe. Apparatus for making shaped bores in a continuous strip. 3,677,055, Cl. 72-326.000.

Longo, John: *See*—
Igneri, Anthony V.; Milack, Joseph, Jr.; and Longo, John, 3,677,205.

Looker, Jerome J.; and Fox, Charles J., to Eastman Kodak Company. Bis (dialkylaminoaryl) ethylene photoconductors. 3,677,752, Cl. 96-1.500.

Loqvist, Kaj-Ragnar, to Fagersta Bruks Aktiebolag. Composite tool. 3,677,060, Cl. 72-476.000.

Lorange, Jean G., to Bell Telephone Company of Canada, The. Coin operated telephone network allowing limited free calls. 3,678,203, Cl. 179-6.30r.

Lord Corporation: *See*—
Beck, Merrill G., 3,677,535.
Rautine, Donald E., 3,677,122.

Lorenz, Max R., to International Business Machines Corporation. Liquid epitaxy method of fabricating controlled band gap Ga Al as electroluminescent devices. 3,677,836, Cl. 148-171.000.

Lorenzen, Walter C., to Anzen Products, Inc. Adjustable liquid discharge jet. 3,677,474, Cl. 239-587.000.

Lovelock, James E., to Pye Limited. Method and apparatus for controlling the flow of gases. 3,677,275, Cl. 137-13.000.
Lowry, Alan B.; Mathus, Gregory; and Staciokas, Leon, to Data Packaging Corporation and Digital Information Devices, Inc. Tape cartridge mechanism for computer. 3,677,497, Cl. 242-199.000.
Lozo, Frederick M., III: *See—*
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Lucas, Joseph, (Industries) Limited: *See—*
Jones, Richard Clive, 3,678,449.
Morris, John, 3,677,287.
Young, Donald Allan, 3,678,448.
Lucas, Joseph, Industries Limited: *See—*
Shaw, Jeffery Isaac, 3,678,342.
Luciano, De Pietri, to Intercosmo s.n.c. Cosmetics container. 3,677,271, Cl. 132-79.000.
Lucien, Rene, to Societe Messier. Disc brake assembly with replaceable friction members. 3,677,373, Cl. 188-73.600.
Luck, Dieter G. Hydraulically operated equipment. 3,677,426, Cl. 214-138.00r.
Luckey, George W.: *See—*
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Ludewig, Frederick A., Jr.; and Van Luik, Frank W., Jr., to Environment/One Corporation. Multi-zone incipient or actual fire and/or dangerous gas detection system. 3,678,487, Cl. 340-236.000.
Ludlow Corporation: *See—*
Muri, Richard L.; and Vere, Thomas D., 3,677,817.
Luft, Robert G., to International Harvester Company. Drive train for low profile vehicle. 3,677,358, Cl. 180-44.00r.
Luhrs, Otto R., to International Business Machines Corporation. Angulated positioning marks for moving web. 3,678,220, Cl. 179-100.250.
Lund, Carl H.; Hockin, John; and Woulds, Michael J., to Martin-Marietta Corporation. Casting process for nickel base alloys. 3,677,331, Cl. 164-122.000.
Lund, Carl H.; Hockin, John; and Woulds, Michael J., to Martin-Marietta Corporation, mesne. Heat treatable alloy. 3,677,746, Cl. 75-171.000.
Lund, Carl H.; Hockin, John; and Woulds, Michael J., to Martin-Marietta Corporation, mesne. High temperature castable alloys and castings. 3,677,747, Cl. 75-171.000.
Lundquist, Martin A.: *See—*
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Lutchansky, Milton; and Rhines, Warren Joseph, to Bell Telephone Laboratories, Incorporated. Impact energy absorber. 3,677,371, Cl. 188-1.00c.
Lutz, Michael A.; and Hofmann, Gunter A.G., to Hughes Aircraft Company. Magnetic field control circuit for crossed field switching devices. 3,678,289, Cl. 307-149.000.
Luyster, Thomas, Jr.: *See—*
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Lynch, Charles Andrew, Jr.; and Orwoll, Edward Francis, to FMC Corporation. Complexes of heavy metal salts of acid phosphate esters. 3,678,086, Cl. 260-429.900.
Lynch, James F., Jr.: *See—*
Jeff, William C.; Luyster, Thomas, Jr.; Lynch, James F., Jr.; and Moroli, Frank A., 3,677,794.
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Mac Isaac, John T., Jr.; and Troy, James E., to Fieldcrest Mills, Inc. Apparatus for making tufted fabrics. 3,677,206, Cl. 112-79.00r.
MacCallum, James A.; Howard, Velmar E.; and Coberley, Daniel A., to Hurletion Incorporated. Method for covering a printing roller. 3,677,856, Cl. 156-187.000.
MacDonald, William A., Jr., to Eastman Kodak Company. Environment control device for electrophotographic apparatus. 3,677,632, Cl. 355-3.000.
MacDuff, Richard; and Stewart, Paul M., to Hercules Incorporated. Oven for heating continuous tubing. 3,677,530, Cl. 263-3.000.
Mack, Grnat V., to Reynolds Metals Company. Casket construction and method of making same. 3,676,905, Cl. 27-6.000.
MacKellar, Donald G.: *See—*
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Mackenzie, Elbert K., to Electro-Mechanical Instrument Company, Inc. Readout devices with light conducting channels. 3,677,619, Cl. 350-110.000.
Mackenzie, Robert A. Draw forming. 3,677,057, Cl. 72-305.000.
Macknik, Louis S.; and Kissell, Kenneth E., to United States of America, Air Force. Automatic variable gain optical tracker for space vehicles comprising DC system for error signal generation. 3,678,279, Cl. 250-203.000.
Macmillan, Francis S. Kilmer; and Lyness, Warren I., to Procter & Gamble Company, The. Compositions for topical application to animal tissue and method of enhancing penetration thereof. 3,678,156, Cl. 424-68.
MacPherson, Ian Alexander; Inman, Eric Richard; Stirling, John Andrew; and Irvine, Alexander McHugh, to Ciba-Geigy AG. Pigmentary form of an azomethine. 3,677,782, Cl. 106-288.00q.
Maddestra, Robert: *See—*
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Maeda, Kazuo: *See—*
Fujiwara, Ryozo; Ohara, Eiji; and Maeda, Kazuo, 3,677,699.
Magis, Sigfred F., to United States of America, Navy. Naturally fragmenting projectiles of AISI 06 steel. 3,676,907, Cl. 29-1.210.
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Maguire, Mary H.; Gough, Geoffrey R.; and Michal, Frank, to University of Sydney, The. Inhibiting or preventing thrombus formation with 2-methylthioadenosine-5'-monophosphate. 3,678,162, Cl. 424-180.000.
Mahlstede, Gerald F.; and Carruth, Buster L., to Polar Chilled Products Co., Inc. Bottle rinsing apparatus. 3,677,273, Cl. 134-127.000.
Maholick, Andrew W.: *See—*
Freeman, Richard B.; Kawalec, Michael T.; Maholick, Andrew W.; and Stager, Stanley R., III, 3,678,469.
Maidenform Inc.: *See—*
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Maier, Robert. Method of making a connector plug. 3,676,927, Cl. 29-629.000.
Majima, Kanji; and Morita, Goro, to Kao Soap Co., Ltd. Process for preparing purified linear alkylate bottom. 3,677,934, Cl. 208-323.000.
Makachev, Nikolai Ivanovich; and Parshin, Alexei Nikolaevich. Pneumatic rapier for inserting weft thread into warp sheds. 3,677,304, Cl. 139-127.00p.
Maleck, Le Roy R., to Stewart Research, Inc. Hinge and door detent. 3,676,895, Cl. 16-150.000.
Maleck, Le Roy R., to Admiral Corporation. Hinge and door detent. 3,676,896, Cl. 16-150.
Malek, Fritz J., to Metrophysics, Inc. Method and apparatus for measuring radiation absorption in a fluid specimen. 3,678,269, Cl. 250-43.50r.
Mallett, Wallace L. E. Bale lifter. 3,677,428, Cl. 214-147.00g.
Mallinckrodt Chemical Worsk: *See—*
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Mammino, Joseph; and Jvirblis, Gail D., to Xerox Corporation. Photoelectrosolographic imaging process. 3,677,750, Cl. 96-1.000.
Mangini, Angelo: *See—*
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Marathon Oil Company: *See—*
Hayes, John B.; and Knight, Bruce L., 3,677,344.
Marchi, Giorgio. Electronic device for electrically braking induction motors, particularly three-phase motors. 3,678,353, Cl. 318-211.000.
Marconi Company Limited, The: *See—*
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Marine Bank and Trust Company, mesne: *See—*
Gibbs, James W.; and Gibbs, John L., 3,677,294.
Markham, David Rees, to Deere & Company. Method and apparatus for sharpening forage harvester knives. 3,677,316, Cl. 146-242.000.
Marshall, Jefferson: *See—*
Williams, Frank Ronald; Whitehead, Jack; Marshall, Jefferson; Conners, Alan; and Gosden, Derek Vernon, 3,677,740.
Martin, Anthony Michael. Apparatus for forming helical gear wheel bodies from powder. 3,677,671, Cl. 18-16.500.
Martin, Arthur Seymon. Method and apparatus for determining the coefficient of diffusion of a dissolved solute in unsaturated solution. 3,677,071, Cl. 73-61.400.
Martin, Clyde J., to Martin Industries, Inc. Pressure gauge. 3,677,089, Cl. 73-419.000.
Martin, Godfrey Q., to Shell Oil Company. Fluid diffusion apparatus. 3,677,528, Cl. 261-87.000.
Martin Industries, Inc.: *See—*
Martin, Clyde J., 3,677,089.
Martin, Joseph L., to Anvil Industries, Inc., mesne. Prefabricated conduit. 3,677,303, Cl. 138-109.000.
Martin, Michel, to Compagnie de Saint Gobain. Method for vertical suspension of glass sheets during thermal treatment. 3,677,731, Cl. 65-102.000.
Martin, Thomas B. Flow control valve. 3,677,288, Cl. 137-501.000.
Martin-Marietta Corporation: *See—*
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Lund, Carl H.; Hockin, John; and Woulds, Michael J., 3,677,331.
Martin-Marietta Corporation, mesne: *See—*
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Martinsons, Aleksandrs, to PPG Industries, Inc. Electrode coatings. 3,677,917, Cl. 204-99.000.
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Marvin Glass & Associates: *See*—
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Marvin Glass & Ssociates: *See*—
Breslow, Jeffrey Dale, 3,677,545.
Marvin, Neil T., to Bra-Con Industries, Inc. Bale ejector. 3,677,175, Cl. 100-35.000.
Marx, John W., to Phillips Petroleum Company. Cellulose sponge for removing oil slicks. 3,677,982, Cl. 260-2.50r.
Marx, Matthias: *See*—
Eckert, Guenter; Marx, Matthias; Hartmann, Heinrich; and Wuertele, Lothar, 3,677,813.
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Masson, Narinder; Korenicki, William John; and Lechner, Walter Ludwig, to Gamon-Camet Industries, Inc. Compound fluid meter. 3,677,084, Cl. 73-197.000.
Mast, Milfred E.: *See*—
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Masten, Michael K.: *See*—
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Choate, William C.; and Masten, Michael K., 3,678,470.
Mastromatteo, Richard; and Brett, Thomas J., Jr., to Uniroyal, Inc. Cocure of blend of rubber of low unsaturation and highly unsaturated rubber using long chain hydrocarbon dithiocarbamate accelerators. 3,678,135, Cl. 260-889.000.
Mathers, Ronald Alexander. Chessmen. 3,677,550, Cl. 273-137.00r.
Mathisen, Einar S., to International Business Machines Corporation. Contactless mask pattern exposure process and apparatus system having virtual extended depth of focus. 3,677,634, Cl. 355-2.000.
Mathus, Gregory: *See*—
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Yamamura, Katsumi; Miyasaka, Tsugumitsu; Hayashi, Shinichi; Yamamoto, Masao; and Matsubara, Yukio, 3,677,909.
Matsuda, Hideaki; Mori, Hisakazu; and Yamauchi, Fujio, to Okura Kogyo Kabushiki Kaisha. Method of producing phosphorus-containing curable material. 3,678,012, Cl. 260-77.5ar.
Matsui, Kenichi: *See*—
Fukuma, Noboru; Kobayashi, Hidehiko; Matsui, Kenichi; Sakashita, Masahira; and Henmi, Hiroshi, 3,677,880.
Matsumoto, Seiji; Sato, Masamichi; and Fukushima, Osamu, to Xerox Corporation. Electric charging method. 3,678,350, Cl. 317-262.00a.
Matsumoto, Shigeru; and Gotoh, Toshiaki, to Nippon Oil Seal Industry Co., Ltd. Pressure control valve for brakes and the like. 3,677,605, Cl. 303-6.00c.
Matsumura, Toichi: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
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Matter, Eric, to Ciba Limited. Process for the manufacture of aryloxazoles. 3,678,042, Cl. 260-240.0ca.
Mattingly, Frederick William, to Toolmasters Limited. Electric motor. 3,678,311, Cl. 310-156.000.
Maturo, Thomas F., Jr.; and Prisinzano, Frank. Beach cart. 3,677,571, Cl. 280-36.00r.
Maulding, Donald Roy, to American Cyanamid Company. Chemiluminescent reaction of chlorinated ethylene carbonate with hydrogen peroxide in the presence of a fluorescer. 3,677,957, Cl. 252-188.300.
Maund, John Keith; and Hands, Clifford Henry George, to Hooker Chemical Corporation. Purification of phosphonitrilic chloride polymers. 3,677,720, Cl. 23-357.000.
Maurel, Andre Bernard: *See*—
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Maxam, David R.: *See*—
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Maxfield, John Raymond: *See*—
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Maxime, Jacques Paul Robert; and Maurel, Andre Bernard, to Etat Francais. Gunnery control device for turret-mounted firearm. 3,677,134, Cl. 89-41.00e.
Maximov, Igor Petrovich: *See*—
Maximovich, Boleslav Ivanovich; Dudko, Daniil Andreevich; Agafonov, Nikolai Georgievich; Maximov, Igor Petrovich; Andreev, Vadim Grigorievich; Lepilov, Nikolai Yakovlevich; Svinov, Alexei Kapitonovich; Slonimsky, Alexandr Borisovich; Volk, Boris Zakharovich; Gubin, Alexandr Ivanovich; and Katsman, Berta Osipovna, 3,677,330.
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Maxwell, Albert H., Jr., to Westinghouse Electric Corporation. Reverse-direction tape translation. 3,678,484, Cl. 340-174.10h.
Mayer, Edward H.; and Oliver, Evan M., to Bethlehem Steel Corporation. Nitride strengthened steel. 3,677,834, Cl. 148-36.
Mazzara, Vincent B.; and Fesperman, Jerome M., to Standard Oil Company. Oil fracturing propping agents. 3,677,941, Cl. 252-8.55r.
Mc Allister, Jack G. Roof structure. 3,676,976, Cl. 52-747.000.
Mc Caully, Ronald J., to American Home Products Corporation. 2,3-Dihydro-2-oxo-1H-1,4-benzodiazepine-3-carboxylic acid esters and related compounds. 3,678,043, Cl. 260-239.300.
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Mc Kenzie, John, to Leesona Limited. Winding machine. 3,677,482, Cl. 242-18.00r.
Mc Neil, Daniel E., to Controls Switch, Inc., mesne. Lens assembly for indicator lights. 3,678,261, Cl. 240-151.000.
McCarty, Clyde W., to General Electric Company. Electronic digital clock power failure indicator. 3,678,499, Cl. 340-336.000.
McCaully, Ronald J., to American Home Products Corporation. Dialkanoyloxyacetyl penicillanic acid derivatives. 3,678,032, Cl. 260-239.100.
McClain, Albert D., Jr.: *See*—
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McClellan, William R.; and Stiles, Alvin B., to Du Pont de Nemours, E. I., and Company. Conversion of methanol to formaldehyde using a bismuth molybdate on silica catalyst. 3,678,139, Cl. 260-603.0hf.
McConkey, Robert C.: *See*—
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McCoy, Donald Walter: *See*—
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McCurdy, Hugh R.; Rausch, Doyle W.; and McIntire, Hoy O., to Battelle Development Corporation, The. Method of making high-density sintered chromium-bearing iron alloys. 3,677,749, Cl. 75-211.000.
McDonnell Douglas Corporation: *See*—
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McElroy, Bobby Joe; and Merkley, Joseph Herbert, to Lithium Corporation of America. Preparation of telomeric liquid polybutadiene oils. 3,678,121, Cl. 260-668.00b.
McFarland, Otho K.; and Tamburrino, James F., to Abbott Laboratories. Electronic apparatus for accurately monitoring and recording the partial pressure of a gas. 3,678,375, Cl. 324-29.000.
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McGuire, Kenneth John, to Delaney Gallay Limited. Heat shields. 3,677,870, Cl. 161-43.000.
McHenry, Edwin John: *See*—
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McIlvaine, Robert L., to National Dust Collector Corporation. Method and apparatus for removing sludge from liquid. 3,677,407, Cl. 210-83.000.
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McIver, Clement L., Jr., to Methods, Incorporated. Lathe turret. 3,677,110, Cl. 74-813.00l.
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Trecker, David J.; and McKeon, James E., 3,678,096.

McMurray, William, to General Electric Company. Versatile power converters with a high frequency link. 3,678,367, Cl. 321-7.000.

McNally, Sellers B., to Maremont Corporation. Adjustable shock absorber assemblies. 3,677,561, Cl. 280-124.00f.

McNeff, Larry Cecil, to Cargill Incorporated. Molasses-urea reaction mixtures. 3,677,767, Cl. 99-6.000.

McPhee, Charles J., to American Hospital Supply Corporation. Surgical irrigation apparatus and method of using same. 3,677,248, Cl. 128-227.000.

Mead Corporation, The: *See—*
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Meanor, Doyle W.: *See—*
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Meji Seika Kaisha Ltd.: *See—*
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Melnick, Daniel: *See—*
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Menasco Manufacturing Company: *See—*
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Mencarelli, Vittorio. Ball valve. 3,677,514, Cl. 251-148.000.

Mendez, Charles E. Fuel transfer system for tractor trailer vehicles. 3,677,284, Cl. 137-351.000.

Merck & Co., Inc.: *See—*
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Merkley, Joseph Herbert: *See—*
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Merriman, Inc.: *See—*
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Merritt, Richard F.: *See—*
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Merryman, George B.; and Merryman, Joseph H. Vibration monitoring system. 3,677,077, Cl. 73-146.000.

Merryman, Joseph H.: *See—*
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Mertzweiller, Joseph K.; and Tenney, Horace M., to Esso Research and Engineering Company. Hydrogenation of organic compounds. 3,677,969, Cl. 252-431.000.

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Meshbane, Alex; and Vilardi, Frank, to Savant Instruments, Inc. Electrophoresis testing apparatus. 3,677,930, Cl. 204-299.000.

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Metevia, Virgil L.; Narlock, Raymond M.; and Mast, Milfred E., to Dow Corning Corporation. Article of silicone rubber having surfaces resistant to dirt pick-up. 3,677,877, Cl. 161-164.000.

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Meyers, Peter G.; Sweeney, Eric C.; and Brunkhardt, Frederick W., to Meyers Electrocooling Products, Inc. Refuse handling system. 3,677,422, Cl. 214-17.00d.

Meyers, Raymond E.; and Eubanks, Edgar W., to SCM Corporation. Acid-stabilized epoxide resin coating compositions and method of preparing same. 3,678,004, Cl. 260-47.0ec.

Meyers, Richard D.: *See—*
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Meyers, Warren H.: *See—*
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Michaud, Andre. Hockey stick. 3,677,542, Cl. 273-67.00a.

Middlebrook, Terence C., to Phillips Petroleum Company. Blend of ethylene-butene copolymer with butadiene-styrene radial block copolymer. 3,678,134, Cl. 260-876.00b.

Middleton, William J., to Du Pont de Nemours, E. I., and Company. 1,1-Bis(trifluoromethyl)-2,2-diphenylethylenes having selected substituents on phenyl. 3,678,117, Cl. 260-619.00r.

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Miller, Arthur William: *See—*
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Miller, Charles W., to Minnesota Mining and Manufacturing Company. Detection of recorded control signals upon reproduction from recording medium. 3,678,221, Cl. 179-100.250.

Miller, Donald L., to Bendix Corporation, The. Self-adjusting electromagnetic clutch-brake. 3,677,377, Cl. 192-18.00b.

Miller, Fred B.: *See—*
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Miller, Leo H.; and Colegrove, James A., to Burroughs Corporation. Lithoplate bender. 3,677,059, Cl. 72-403.000.

Miller, Leroy J.; and Bilow, Norman, to Hughes Aircraft Company. Commercially useful polyphenylene polymers and method of production thereof. 3,677,976, Cl. 260-2.00h.

Miller, Stanley J.; and Davidson, James P., to National Can Corporation. Method of venting an aerosol dome. 3,677,211, Cl. 113-121.0aa.

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Mitsche, Roy T.; and Michalko, Edward, to Universal Oil Products Company. Transalkylation of alkylaromatic hydrocarbons in contact with a zeolite catalyst composition. 3,677,973, Cl. 252-455.00f.
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Miyake, Shigenobu, to Chuo Tatemono Co., Ltd. Method for directly electrochemically extracting gallium from a circulating aluminate solution in the Bayer process by eliminating impurities. 3,677,918, Cl. 204-105.00r.
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Moore, Dan B. Log type building unit. 3,676,969, Cl. 52-233.000.
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Morgan, Jack B., to Allegheny Ludlum Industries, Inc. Method and apparatus for evaluating metal cleanliness. 3,677,073, Cl. 73-67.900.
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Morita, Katsuhiko; and Yamamoto, Yoshio, to Kabushiki Kaisha Daini Seikosha. Return mechanism for a stopwatch or a chronograph. 3,676,995, Cl. 58-76.000.
Morita, Ken-Ichi; Suzuki, Zennosuke; and Hirose, Hiromitsu, to Toray Industries, Inc. Process for the preparation of 2-(hydroxyhydrocarbyl) acrylates. 3,678,093, Cl. 260-468.00r.
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Morris, Louis; and Specht, Theodore R., to Westinghouse Electric Corporation. Interwinding shield for power transformers. 3,678,428, Cl. 336-84.000.
Morrison, Andrew Ivar; and Hannah, Bruce R., to Knoll International, Inc. Slung furniture. 3,677,601, Cl. 297-441.000.
Morrison, Clyde A. Peristaltic fluid pump. 3,677,667, Cl. 417-474.000.
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Morse, John E.; and Rosenburgh, Norman J., to Eastman Kodak Company. Tape dispenser and applicator. 3,677,864, Cl. 156-505.000.

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Moss, Norman, to Plessey Company Limited, The. Fuel-injection devices for mixture-aspiring internal-combustion engines. 3,677,236, Cl. 123-32.0ea.

Moss, Robert D. Power assist barge for ocean service. 3,677,215, Cl. 115-16.000.

Mostyn, William T., Jr., to MusiConics International, Inc. Simultaneous logarithmic conversion and digital display apparatus. 3,678,505, Cl. 340-347.0ad.

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Mottus, Edward H.; and Ort, Morris R., to Monsanto Company. Catalyst for polymerization of olefinic compounds. 3,677,911, Cl. 204-59.0qm.

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Murray, Gregory J.; and Tarrant, Fred K., Jr., to Tarrant Manufacturing Company. Vacuum machine for street cleaning. 3,676,891, Cl. 15-346.000.

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Mussinan, Cynthia; Giacino, Christopher; and Katz, Ira, to International Flavors & Fragrances Inc. Cycloalkyl mercaptan compositions and processes therefor. 3,677,772, Cl. 99-140.

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Nabiullin, Faat Khatovich; Buzova, Zoya Mikhailovna; Gertsik, Mikhailovich; and Zjuzin, Sergei Alexeevich. Arrangement for manufacture of a primary cell electrode. 3,677,824, Cl. 136-175.

Nadazawa, Yoshiyuki; Nakamura, Yashuharu; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide supersensitized photographic emulsion. 3,677,765, Cl. 96-124.000.

Nagamatsu, Takeo; Yamada, Yusaku; and Yamada, Kazumi, to Fujitsu Limited. Video display system including raster type cathode ray tube. 3,678,498, Cl. 340-324.00a.

Nagy, Ernest J., to Pullman Incorporated. Railroad hopper car with plow. 3,677,191, Cl. 105-248.000.

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Naka, Jinshichi; Tokuda, Yasunori; Koono, Takehiko; and Utsugi, Jun, to Takeda Chemical Industries, Ltd. Method for the production of a flavor enhancing crystal. 3,677,773, Cl. 99-140.00n.

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Nakajima, Meiken; and Nakagawa, Yunosuke, to Kao Soap Co., Ltd. Liquid abrasive cleanser composition. 3,677,954, Cl. 252-121.000.

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Nakanishi, Michio; Oe, Takanori; and Maruyama, Yutaka, to Yoshitomi Pharmaceutical Industries, Ltd. 9-Oxoxanthen-2-yl-alkanoic acids. 3,678,077, Cl. 260-335.000.

Nakase, Takashi: *See—*
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Nakatani, Keiji; and Takebe, Kaoru, to Minolta Camera Kabushiki Kaisha. Electrostatic contact printing device for use in a photographic contact printer. 3,677,640, Cl. 355-78.000.

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Narlock, Raymond M.: *See—*
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Nasby, James S.: *See—*
Jaster, Dale R.; and Nasby, James S., 3,678,376.

Nather, Claus Siegfried, to Auergesellschaft GmbH. Pack for gas mantles. 3,677,398, Cl. 206-45.34.

National Can Corporation: *See—*
Miller, Stanley J.; and Davidson, James P., 3,677,211.
Stepenske, Lawrence D.; and Cassidy, Edward K., 3,677,226.

National Cash Register Company, The: *See—*
Graham, Richard E., 3,678,465.

National Distillers and Chemical Corporation: *See—*
Frampton, Orville D.; and Feldman, Julian, 3,678,118.
Watson, Lloyd M.; and Birchall, William R., 3,677,477.

National Dust Collector Corporation: *See—*
McIlvaine, Robert L., 3,677,407.

National Forge Company: *See—*
Bowles, Arnold Gordon, 3,677,674.

National Research Development Corporation: *See—*
Trott, John James; and Grainger, James William, 3,678,378.

National Starch and Chemical Corporation: *See—*
Ray-Chaudhuri, Dilip K.; and Stockmann, Hans H., 3,678,035.
Sirota, Julius; Bentley, David J., Jr.; and Jubilee, Benjamin D., Jr., 3,677,985.

National Union Electric Corporation: *See—*
Berry, Willis E., 3,676,894.

Navara, Joseph. Window brace. 3,677,592, Cl. 292-288.000.

Neanhouse, Nick C. Cartridge loaded alarm device. 3,676,945, Cl. 42-1.00g.

Necchi S.p.A.: *See—*
Perlino, Silvano, 3,677,210.

Nee, Michael A., to Norris Industries, Inc. Disposable projectile launcher of the recoilless type. 3,677,131, Cl. 89-1.703.

Neeb, Rudolf, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Process for the manufacture of 6-nitro-9-amino-2-ethoxy-acridine. 3,678,054, Cl. 260-279.00r.

Negretti & Zambra (Aviation) Limited: *See—*
Underwood, Michael John, 3,678,231.

Nelson, Gordon E. Snow sled. 3,677,568, Cl. 280-21.00r.

Nepomiastchy, Alexis: *See—*
Boulin, Jacques R.; and Nepomiastchy, Alexis, 3,678,419.

Nerz, Joseph E., to Extracorporeal Medical Specialties, Inc. Separable surgical needle. 3,677,243, Cl. 128-214.400.

Neti, Radhakrishna M.: *See—*
Harman, John N., III; and Neti, Radhakrishna M., 3,677,708.

Neumann, Charles G.: *See—*
Nitschneider, Robert M.; Neumann, Charles G.; and Krueger, Harvey R., 3,677,461.

Newell, John Anthony, to Bell Telephone Laboratories, Incorporated. Automatic gain control having a fast broadband attack mode and a slow narrow band receiver mode. 3,678,393, Cl. 325-410.000.

Newman, James W.: *See—*
Gordon, William F.; and Newman, James W., 3,677,490.

Newstead, Charles; Cullen, John Lesley; and Zajko, Michal, to Girling Limited. Cam actuated drum brake. 3,677,374, Cl. 188-329.000.

Newton, George R.; and Jageler, Alfred H., to Amoco Production Company. Sidewall well-formation fluid sampler. 3,677,081, Cl. 73-155.000.

Nexsen, William E., Jr.: *See—*
Coensgen, Frederic H.; and Nexsen, William E., Jr., 3,677,889.

Nichols, Andrew J.: *See—*
Condon, David C.; and Nichols, Andrew J., 3,678,462.

Nichols, Duane W., to Whirlpool Corporation. Axially movable twist tray domestic ice maker. 3,677,030, Cl. 62-353.000.

Nicholson, Donald R. Animal dehorning apparatus. 3,676,929, Cl. 30-228.000.

Nickelsen, Hubert O.; Kopanda, Joseph E.; and Piasecki, Felix J., to United States Steel Corporation. Method of making cement clinkers. 3,677,781, Cl. 106-100.000.

Nielsen, Asger T., to Compufoto, Inc. Data source microfilm recorder with forms overlay. 3,677,146, Cl. 95-1.100.

Nikles, Erwin, to Ciba-Geigy AG. Process for the manufacture of oximinodithiolanes. 3,678,074, Cl. 260-327.00m.

Nikles, Erwin, to Ciba-Geigy AG. Carbamoyloximino-alkenyldithiolanes. 3,678,075, Cl. 260-327.00m.

Nikolaos, Christopoulos: *See—*
Werner, Nickel; and Nikolaos, Christopoulos, 3,677,151.

Nilles, James Jacob: *See—*
Kirkpatrick, Truman; and Nilles, James Jacob, 3,677,783.

Nilson, Jay B.: *See—*
Dalziel, Warren L.; Nilson, Jay B.; and Wartner, Donald L., 3,678,481.

Nimerick, Kenneth H.: *See—*
Stout, Caleb M.; Nimerick, Kenneth H.; and Parks, Christ F., 3,677,014.

Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.): *See—*
Nishizawa, Masahiro, 3,677,757.

Nippon Electric Co., Ltd.: *See—*
Nishida, Nobuo; and Sakaguchi, Mitsuhito, 3,677,622.

Nippon Electric Company, Limited: *See—*
Kuroda, Takaji, 3,678,415.
Terazawa, Yoshizumi; and Ayaki, Kazuo, 3,678,317.

Nippon Kokan Kabushiki Kaisha: *See—*
Arimura, Tohru; Kamata, Masamoto; Saito, Morio; Suzuki, Hiromu; and Iguchi, Masakazu, 3,677,045.
Hatagi, Hiroyuki; Kanamaru, Kenichi; and Funasaki, Yasuo, 3,678,226.

Nippon Oil Seal Industry Co., Ltd.: *See—*
Matsumoto, Shigeru; and Gotoh, Toshiaki, 3,677,605.

Nippon Piston Ring Co., Ltd.: *See—*
Sugahara, Eisuke, 3,677,558.

Nippon Seiko Kabushiki Kaisha: *See—*
Suzuki, Toshio, 3,677,032.

Nippon Soda Co., Ltd.: *See—*
Ishii, Keiichiro; Ueyama, Michio; Miyazaki, Koshin; and Noto, Tetsuo, 3,677,777.
Suzuki, Hisao; Musashi, Akira; Hiruta, Makoto; and Muramoto, Hiroo, 3,678,014.

Nippon Steel Corporation: *See—*
Akuta, Tomohiko; Honsyo, Yoshi; Hashirizaki, Sinya; Hiruma, Teruo; and Kurasawa, Kazuo, 3,678,192.
Asano, Hidejiro; and Ouyagi, Yashichi, 3,677,797.

Nippondenso Kabushiki Kaisha: *See—*
Oishi, Kazuo; Kurebayashi, Tokuhiro; Ando, Noriyoshi; Yamamoto, Noboru; and Yoshida, Hiroshi, 3,677,253.
Takeda, Yosiaki, 3,678,224.

Nishi, Seiya; Oshio, Akira; and Kiyomitsu, Eto, to Onoda Cement Company Limited. Method of producing high strength mortar or concrete. 3,677,780, Cl. 106-90.000.

Nishida, Jun; and Ohhara, Takahumi, to Matsushita Electric Industrial Company, Limited. High-field emission cathodes and methods for preparing the cathodes. 3,678,325, Cl. 313-346.000.

Nishida, Nobuo; and Sakaguchi, Mitsuhito, to Nippon Electric Co., Ltd. Light deflector comprising cascaded light displacement means and hologram plate. 3,677,622, Cl. 350-163.000.

Nishijima, Yasushi: *See—*
Oohara, Saburo; Amemiya, Koitsuro; Nishijima, Yasushi; Fukushima, Mitsuyoshi; and Shimizu, Kunio, 3,677,871.

Nishizawa, Masahiro, to Nippon Columbia Kabushikikaisha (Nippon Columbia Co., Ltd.). Method of making phosphor screen for color cathode ray tube. 3,677,757, Cl. 96-36.100.

Nissan Motor Company, Limited: *See—*
Takagi, Takeshi; Kawamoto, Tamio; and Miyazaki, Toshio, 3,677,381.

Nitda, Taro; Yumoto, Hiroshi; Tsuruoka, Takashi; Hammoto, Kazuko; Shomura, Takashi; and Ohashi, Takao, to Meji Seika Kaisha Ltd. Antibiotics obtained from streptomyces miharaensis. 3,678,159, Cl. 424-116.000.

Nitschneider, Robert M.; Neumann, Charles G.; and Krueger, Harvey R., to Reynolds Products Inc. Security device. 3,677,461, Cl. 232-15.000.

Nitzsche, Siegfried: *See—*
Kaiser, Wolfgang; Nitzsche, Siegfried; Wohlfarth, Ernst; and Hittmair, Paul, 3,677,996.
Kaiser, Wolfgang; Nitzsche, Siegfried; Wohlfarth, Ernst; Strasser, Alois; and Hittmair, Paul, 3,677,997.
Kaiser, Wolfgang; Nitzsche, Siegfried; Wohlfarth, Ernst; and Hittmair, Paul, 3,678,003.

Nitzsche, Siegfried; Kaiser, Wolfgang; Wohlfarth, Ernst; and Hittmair, Paul, to Wacker-Chemie G.m.b.H. Method for preparing hydrophobic silica. 3,677,784, Cl. 106-309.000.

Nitzsche, Siegfried; and Wohlfarth, Ernst, to Wacker-Chemie G.m.b.H. Ambient temperature curable silicone rubber compositions. 3,678,002, Cl. 260-18.00s.

Niwa, Kunihiko: *See—*
Iwasaki, Masahiro; Goto, Nobuyuki; Fujisaki, Hiroya; and Niwa, Kunihiko, 3,678,390.

Nixon, Dalbro R., Jr.; McIlhenny, David J.; and Harrell, Marvin L., to Virginia Chemicals Inc. Multiple aerosol dispenser. 3,677,441, Cl. 252-63.000.

NL Industries, Inc.: *See—*
Blumenthal, Warren B., 3,677,798.

Nnadi, John C., to Mobil Oil Corporation. Novel phosphorus containing pyrimidines and lubricants containing same. 3,677,943, Cl. 252-46.700.

Noguchi, Yoji: *See—*
Mori, Hisayuki; and Noguchi, Yoji, 3,677,670.

Nold, Walter E. Apparatus and method for degassing a liquid. 3,676,983, Cl. 55-192.000.

Noon, Alonzo W., to Electroprint, Inc. Toner charging and feeding machine. 3,677,224, Cl. 118-63.000.

Norcross, Austin S., to Norcross Corporation. Magnetically coupled viscometer. 3,677,070, Cl. 73-57.000.

Norcross Corporation: *See—*
Norcross, Austin S., 3,677,070.

Nordeen, Erwin E., to Whirlpool Corporation. Vacuum cleaner nozzle lifting device. 3,676,892, Cl. 15-359.000.

Norris Industries, Inc.: *See—*
Nee, Michael A., 3,677,131.

North American Philips Company, Inc.: *See—*
Le Coq, Daniel France, 3,677,833.

North American Rockwell Corporation: *See—*
Booher, Robert K., 3,678,290.
Dyer, George A., 3,678,298.
Ebertin, Michel A., 3,678,476.
Etchell, Gordon, 3,677,121.
Fitzgerald, James E., 3,677,904.
Owens, John M., 3,678,479.

Northrop Corporation: *See—*
Landrum, Bobby L., 3,678,330.

Northrop Weaving Machinery Limited: *See—*
Atkinson, Cyril Millward, 3,677,306.

Notelteirs, Victor Rosallie; and Janssen, Eduard Josef Philomena, to U.S. Philips Corporation. Filament support for tubular lamp. 3,678,319, Cl. 313-271.000.

Noto, Tetsuo: *See—*
Ishii, Keiichiro; Ueyama, Michio; Miyazaki, Koshin; and Noto, Tetsuo, 3,677,777.

Noumi, Kazunobu: *See—*
Sugimoto, Yoshitaka; Sannomiya, Isao; and Noumi, Kazunobu, 3,677,694.

Novak, Raymond F.: *See—*
Ramspeck, Howard B.; and Novak, Raymond F., 3,677,457.

Novar Corporation: *See—*
Condon, David C.; and Nichols, Andrew J., 3,678,462.

Novo Terapeutisk Laboratorium A/S: *See—*
Aunstrup, Knud, 3,677,902.

Nuckolls, Joe A., to General Electric Company. Lamp control circuit with high leakage reactance transformer and controlled bilateral switching means. 3,678,371, Cl. 323-6.000.

Nussbaum, Eric; Toy, Wing Noon; and Woinsky, Melvin Neil, to Bell Telephone Laboratories, Incorporated. Multiprocessor with cooperative program execution. 3,678,467, Cl. 340-172.500.

N.V. Tot Aanneming van Werken voorheen H. J. Nederhorst: *See—*
Van Weele, Abraham Francois, 3,677,018.

Nybom, Nils Goran; deceased (by Nybon, Ethel Barbro Louis; administratrix), to AB Instrumenta. Coating device for producing a thin layer of a fluid or semi-fluid material. 3,677,227, Cl. 118-415.000.

Nybon, Ethel Barbro Louis: *See—*
Nybom, Nils Goran, 3,677,227.

Nyholm, Erik: *See—*
Bryk, Petri; Haani, Martti; Honkasalo, Jorma B.; Kinnunen, Jorma; Lindsjo, Olle; Nyholm, Erik; Poijarvi, Jaakko; Rastas, Jussi; and Kangas, Juhani, 3,677,696.

Oatley, Charles W., to Cambridge Scientific Instruments Limited. Electron beam apparatus. 3,678,384, Cl. 324-158.00r.

Oba, Harutaro; Sawazu, Toshihiko; Takeuchi, Sugio; and Yamaguchi, Norio, to Tokyo Electric Co., Ltd. Adding, subtracting and totaling calculator. 3,677,464, Cl. 235-60.0tk.

Obergfell, Allen R.: *See—*
Ramspeck, Howard B.; and Obergfell, Allen R., 3,677,456.

Oberst, Charles V.; and Oberst, Glen C., to EdAids, Inc. Student responder teaching device. 3,676,939, Cl. 35-48.00r.

Oberst, Glen C.: *See—*
Oberst, Charles V.; and Oberst, Glen C., 3,676,939.

O'Brien, Walter F., 50% to Cucchiara, Philip M. Harpsichord with sustain mechanism. 3,677,124, Cl. 84-258.000.

O'Connell, John T.: *See—*
Wayson, Andrew J.; and O'Connell, John T., 3,676,917.

O'Connor, Chadwell. Tiedown device. 3,677,509, Cl. 248-187.000.

Oe, Takanori: *See—*
Nakanishi, Michio; Oe, Takanori; and Maruyama, Yutaka, 3,678,077.

Oetiker, Hermann Walter, to Polytronic SA. Impenetrable automatically registering target. 3,677,546, Cl. 273-102.20r.

Ohara, Eiji: *See—*
Fujiwara, Ryozo; Ohara, Eiji; and Maeda, Kazuo, 3,677,699.

O'Hare, Louis Richard. Corona cell for nitrogen and other reactions. 3,677,931, Cl. 204-312.000.

Ohashi, Takao: *See—*
Nitda, Taro; Yumoto, Hiroshi; Tsuruoka, Takashi; Hammoto, Kazuko; Shomura, Takashi; and Ohashi, Takao, 3,678,159.

Ohgoshi, Akio: *See—*
Yoshida, Susumu; Ohgoshi, Akio; Miyaoka, Senri; and Katagiri, Yoshiharu, 3,678,318.

Ohhara, Takahumi: *See—*
Nishida, Jun; and Ohhara, Takahumi, 3,678,325.

Ohio Brass Company, The: *See—*
Kalb, John W., 3,678,340.

Ohta, Wasaburo; and Sakai, Katsuo, to Kabushiki Kaisha Ricoh. Polarity reversal electrophotography. 3,677,751, Cl. 96-1.00r.

Oishi, Kazuo; Kurebayashi, Tokuhiro; Ando, Noriyoshi; Yamamoto, Noboru; and Yoshida, Hiroshi, to Nippondenso Kabushiki Kaisha. Capacitor discharge type ignition system for internal combustion engines. 3,677,253, Cl. 123-148.00e.

Okada, Takashi, to Sony Corporation. Semiconductor circuit for phase comparison. 3,678,185, Cl. 178-5.4sd.

Okamura, Seizo: *See—*
Ito, Akihiko; Nakase, Yoshiaki; Kojima, Katsumi; Yoshida, Masaru; Iwai, Tadashi; Hayashi, Koichiro; and Okamura, Seizo, 3,677,922.

Okumura, Minoru, to Konishiroku Photo Industry Co., Ltd. Method for recording a photographic density. 3,678,188, Cl. 178-6.60r.

Okumura, Tamotsu; and Kadono, Tetsuro, to Shionogi & Co., Ltd. Sintered chromatographic plate and method for producing the same. 3,677,410, Cl. 210-198.000.

Okura Kogyo Kabushiki Kaisha: *See—*
Matsuda, Hideaki; Mori, Hisakazu; and Yamauchi, Fujio, 3,678,012.

Oldfield, Thomas Alfred, to Plessey Company Limited, The. Supercharging means for internal-combustion engines. 3,676,999, Cl. 60-13.000.

O'Leary, Kevin J.: *See—*
Bennett, John E.; and O'Leary, Kevin J., 3,677,975.

Olin Corporation: *See—*
Caule, Elmer J., 3,677,828.

Oliver, Evan M.: *See—*
Mayer, Edward H.; and Oliver, Evan M., 3,677,834.

Oliver, Jay Thomas, to Formica Corporation. Decorative laminate surfaced with a transparent film of polyvinyl fluoride which film is temporarily covered with a transparent film of nylon. 3,677,876, Cl. 161-165.000.

Oliver, Joseph R.: *See—*
Fletcher, Ralph A.; and Oliver, Joseph R., 3,677,258.

Oliver, Maywood. Banjo having combination banjo body and tone rings. 3,677,125, Cl. 84-271.000.

Oliver, Robert K.; and Ford, George L., to Union Oil Company of California. Method of using a coke preheater. 3,677,533, Cl. 263-52.000.

Olivetti, Ing. C., & C., S.p.A.: *See—*
Bartocci, Antonio, 3,678,483.
Bretti, Franco, 3,677,385.
Serracchioli, Francesco; and Restivo, Francesco, 3,678,179.

Olszewski, Walter J., to Union Carbide Corporation. Gas liquefaction process and apparatus. 3,677,019, Cl. 62-9.000.

O'Neal, Donald V.; and Kizielewski, Edward T., to Motorola, Inc. Audio-visual display apparatus for receiving cartridges containing audio visual information. 3,677,630, Cl. 353-15.000.

O'Neill, Joseph L.: *See—*
Allen, Donald J.; and O'Neill, Joseph L., 3,678,163.

Ono, Ichiro, to Alps Electric Co., Ltd. Preset device for all channel tuner using variable reactance element as tuning element. 3,678,421, Cl. 334-15.000.

Onoda Cement Company Limited: *See—*
Nishi, Seiya; Oshio, Akira; and Kiyomitsu, Eto, 3,677,780.

Oohara, Saburo; Amemiya, Koitsuro; Nishijima, Yasushi; Fukushima, Mitsuyoshi; and Shimizu, Kunio, to Kanegafuchi Boseki Kabushiki Kaisha. Multi-layered artificial leather material. 3,677,871, Cl. 161-84.000.

Oosone, Koozo, to Sony Corporation. Magnetic recording and reproducing device. 3,677,556, Cl. 274-4.00c.

Opresko, Stephen Thomas: *See—*
Stoller, Arthur Irwin; and Opresko, Stephen Thomas, 3,677,848.

Optical Research and Development Corporation: *See—*
Schwemin, Arnold J., 3,677,618.

Organon Inc.: *See—*
De Jager, Evert; and Homan, Jan Daniel Herman, 3,678,027.

Orkwiszewski, Wayne L.: *See—*
Boetto, Charles; and Orkwiszewski, Wayne L., 3,677,348.

Orrell, Irving F., Jr., to United States of America, Army. Digital data transmission and detection system. 3,678,194, Cl. 178-68.000.

Ort, Morris R.: *See—*
Mottus, Edward H.; and Ort, Morris R., 3,677,911.

Ort, Wolfgang, to Eastman Kodak Company. Mechanism for synchronizing operation of a camera shutter and a mechanically actuated flash device. 3,677,158, Cl. 95-11.500.

Orwoll, Edward Francis: *See—*
Lynch, Charles Andrew, Jr.; and Orwoll, Edward Francis, 3,678,086.

Osakeyhtio, A. Ahlstrom: *See—*
Tuomaala, Jorma A. K., 3,676,909.

Osawa, Sadao: *See—*
Tamai, Yasuo; Osawa, Sadao; and Taguchi, Seiichi, 3,677,766.

Osborne, Richard F.: *See—*
Lampi, Rauno A.; Hu, Kwoh H.; and Osborne, Richard F., 3,678,276.

Osher, John E.; Kinney, John D.; and Steinhaus, James F., to United States of America, Atomic Energy Commission. Hydrogen ion beam generating electrode. 3,678,323, Cl. 313-231.000.

Oshima, Teruo: *See—*
Yasui, Seimei; Hirooka, Masaaki; and Oshima, Teruo, 3,678,018.

Oshio, Akira: *See—*
Nishi, Seiya; Oshio, Akira; and Kiyomitsu, Eto, 3,677,780.

Osika, Thomas F., to McGill Manufacturing Company, Inc. Spring mounted key for electrical switch. 3,678,229, Cl. 200-42.00t.

Osteen, Mitchell M.; and Grindle, James L., to General Electric Company. Lighting assembly device. 3,678,263, Cl. 240-52.000.

Oster, John, Manufacturing Co.: *See—*
Blachly, Donald L.; and Weidner, Jack E., 3,678,246.

Ostwald, Fritz; and Hertell, Siegfried, to ITT Industries, Inc. Volume indicator for fluid tanks. 3,677,220, Cl. 116-118.000.

Oswald, Robert A. Method of producing time-position records of objects. 3,678,189, Cl. 178-6.70r.

Otis Engineering Corporation: *See—*
Sizer, Phillip S., 3,677,345.

Ottaviana, Quintino, to Montecatini Edison S.p.A. Process for dyeing manufactured articles of polyamidic resins. 3,677,689, Cl. 8-4.000.

Outokumpu Oy: *See—*
Bryk, Petri; Haani, Martti; Honkasalo, Jorma B.; Kinnunen, Jorma; Lindsjo, Olle; Nyholm, Erik; Poijarvi, Jaakko; Rastas, Jussi; and Kangas, Juhani, 3,677,696.
Vartiainen, Osmo O., 3,677,327.

Ouyagi, Yashichi: *See—*
Asano, Hidejiro; and Ouyagi, Yashichi, 3,677,797.

Owens, Carlos L.: *See—*
Cutting, Arch E.; Owens, Carlos L.; Williams, Dewey H.; and Hooper, Felix E., 3,677,305.

Owens, John M., to North American Rockwell Corporation. Conductor arrangement for propagation in magnetic bubble domain systems. 3,678,479, Cl. 340-174.0tf.

Owens-Illinois, Inc.: *See—*
Boyer, Joseph E., 3,677,454.

Oxford Chemicals: *See—*
Weaver, Roger; and Schaffstall, Eugene, 3,677,827.

Packard Instrument Company, Inc., mesne: *See—*
Graff, Jack; and Dora, Ralph A., 3,677,706.

Page, Edward, to Rich Manufacturing Company of California, mesne. Fire hydrant. 3,677,282, Cl. 137-283.000.

Page, Russel D.: *See—*
Johnson, Harold M.; and Page, Russel D., 3,677,350.

Paige, Edward George Sydney, to United Kingdom of Great Britain and Northern Ireland, Minister of aviation Supply in Her Britannic Majesty's Government of the. Acoustic surface wave devices. 3,678,305, Cl. 310-8.100.

Palac, Kazimir, to Motorola, Inc. Method of depositing vitreous material on a faceplate panel. 3,677,791, Cl. 117-33.5cm.

Palm, Eugene J.: *See—*
Fink, Robert H.; and Palm, Eugene J., 3,677,010.

Palmieri, John A.: *See—*
Jordan, Paul V.; Palmieri, John A.; and Wade, William T., 3,678,475.

Pan American Petroleum Corporation: *See—*
Silverman, Daniel, 3,677,342.

Panish, Morton B.; and Sumski, Stanley, to Bell Telephone Laboratories, Incorporated. Crystal growth apparatus. 3,677,228, Cl. 118-422.000.

Pantazelos, Theophanes G.: *See—*
Pezaris, Constantine Demetrius; and Pantazelos, Theophanes G., 3,677,831.

Panter, Robert B.; Dufton, John Peter; Duthie, Robert W.; and Verbaas, George, to GTE Automatic Electric Laboratories Incorporated. Dial pulse incoming trunk and register arrangement. 3,678,197, Cl. 179-18.0eb.

Pappalardo, Romano: *See—*
Brecher, Charles; Pappalardo, Romano; and Samelson, Harold, 3,677,959.

Paradis, Daniel L.: *See—*
Klapprott, David K.; and Paradis, Daniel L., 3,678,130.
Klapprott, David K.; and Paradis, Daniel L., 3,678,131.

Parke, Davis & Company: *See—*
Garland, Carl C., 3,676,958.

Parker, John E., to International Business Machines Corporation. Motor armature having an integral driving surface. 3,678,313, Cl. 310-236.000.

Parker, mesne: *See—*
Parker, Samuel A.; and Wilding, Edwin L., 3,677,390.

Parker, Samuel A.; and Wilding, Edwin L., 50% to Griffin & company, 25% to Scheu, Louis O., Jr. and 25% to said Parker, mesne. Leaf aligning method and machinery. 3,677,390, Cl. 198-33.00r.

Parks, Christ F.: *See—*

Stout, Caleb M.; Nimerick, Kenneth H.; and Parks, Christ F., 3,677,014.
Parks, Miles E.; and Stranton, Robert J. Portable card punching apparatus. 3,677,453, Cl. 225-93.000.
Parrish, Russell C., to Phillips Petroleum Company. Material moving apparatus and method. 3,677,311, Cl. 141-1.000.
Parshin, Alexei Nikolaevich: *See*—
Makachev, Nikolai Ivanovich; and Parshin, Alexei Nikolaevich, 3,677,304.
Passal, Frank, to M & T Chemicals Inc. Nickel electroplating and electrolytes therefor. 3,677,912, Cl. 204-49.000.
Passal, Frank, to M & T Chemicals, Inc. Nickel plating. 3,677,913, Cl. 204-49.000.
Passal, Frank; and Tomson, Arthur J., to M & T Chemicals Inc. N-2,3-dibromopropenyl pyridinium, quinolinium and isoquinolinium derivatives. 3,678,055, Cl. 260-290.00r.
Patchen, Lee H. Method for making reinforced grating. 3,678,147, Cl. 264-325.000.
Patent Protection Limited: *See*—
Foreman, Christopher Roy; and Shipman, Patricia Violet, 3,676,985.
Paterson, Stephen, to Cutting Room Appliances Corp. Slack forming device for cloth laying machines. 3,677,536, Cl. 270-31.000.
Patil, Arvind S.; Icraus, John W.; and Block, Jacob. Process for the use of vermiculite in waste water renovation. 3,677,939, Cl. 210-36.000.
Patmore, James R.; Bozenhard, Walter Frank; and Spampanato, Gavino Anthony, to Electronic Associates, Inc. Digitally controlled electronic function generator utilizing a breakpoint interpolation technique. 3,678,258, Cl. 235-150.530.
Patten, Dan H. Land and water craft trailer unit. 3,677,425, Cl. 214-85.100.
Paugh, Edward C.: *See*—
Upstone, Harlan R.; and Paugh, Edward C., 3,678,441.
Pawlina, Julian S., to Tecumseh Products Company. Spark arrester and muffler construction. 3,677,364, Cl. 181-36.00r.
Payne, Harold R., to Borg-Warner Corporation. Defrosting arrangement and method for a refrigeration system. 3,677,025, Cl. 62-81.000.
Payne, Roy David, to International Standard Electric Corporation. Pulse analyzer. 3,678,252, Cl. 235-92.0ev.
Pazder, George J., Jr.: *See*—
Hessler, Henry M., 3,677,313.
Peacock, Ralph W. Method of hand sewing moccasins. 3,676,883, Cl. 12-142.0mc.
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Pearson, Durk J., to TRW Inc. Laser Q-switching monitoring method and apparatus. 3,678,411, Cl. 331-94.500.
Pearson, Harold E., to Gillette Company, The. Spring loaded hinge. 3,676,902, Cl. 24-252.000.
Pedley, Dianne, to Maidenform Inc. Unitary brassiere and slip combination. 3,677,252, Cl. 128-454.000.
Peil, Le Roy E. Apparatus for baggage inspection. 3,678,278, Cl. 250-108.00r.
Pelster, Arthur F.; and Modglin, Donald D., to Kentucky Fried Chicken Corporation, mesne. Deep fat frying equipment. 3,677,174, Cl. 99-417.000.
Pence, Samuel A., Jr., to Dow Chemical Company, The. Organo polymer cements with extended working time. 3,677,987, Cl. 260-29.60m.
Pennwalt Corporation: *See*—
Keith, Frederick Walter, Jr., 3,677,405.
Shapiro, Leonard, 3,677,673.
Pere, Carlo; and Tornich, Fulvio. Method for heating metal slabs or billets in continuous pusher-type furnaces. 3,677,531, Cl. 263-6.00r.
Perlino, Silvano, to Necchi S.p.A. Sewing machine with base extension. 3,677,210, Cl. 112-258.000.
Perricone, Alphonse C.: *See*—
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Perrin, Alfred J.; Dell John D.; Evans, David B.; and Lewis, George Stanley. Coiled tube banks. 3,677,339, Cl. 165-162.000.
Pesterfield, Enos C., Jr.: *See*—
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Peter, Fritz. Wet processing for a continuous length of moving material. 3,677,695, Cl. 8-152.000.
Peters, Charles Michael Dansey. Energy supply apparatus and method for a building. 3,678,284, Cl. 290-1.000.
Peters, Merrit A.: *See*—
Harnish, Mark E.; and Peters, Merrit A., 3,678,143.
Peters, Robert L.; and Koch, Kenneth F., to United States of America, National Aeronautics and Space Administration. CRT blanking and brightness control circuit. 3,678,191, Cl. 178-7.5.
Peters, Theodore Richmond, to Bell Telephone Laboratories, Incorporated. Controlled pause in data processing apparatus. 3,678,463, Cl. 340-172.500.
Peters, Theodore Richmond, to Bell Telephone Laboratories, Incorporated. Controlled pause and restart of magnetic disc memories and the like. 3,678,464, Cl. 340-172.500.
Peterson, Donovan F. Direct current motor having improved commutation means. 3,678,359, Cl. 318-254.000.
Peterson, Ralph, to United States of America, Army. Base ejecting projectile. 3,677,182, Cl. 102-66.000.
Peterson, Reeve D., to United States of America, Navy. Ground station system for retransmitting satellite facsimile signals over digital data links. 3,678,388, Cl. 325-4.000.
Petreycik, Michael G. Chord teaching device. 3,677,130, Cl. 84-471.000.
Petro-Tex Chemical Corporation: *See*—
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Pettersson, Bengt Edvard, to Sunds Aktiebolag. Apparatus for the washing of primarily, cellulosic pulp. 3,677,040, Cl. 68-181.
Pezaris, Constantine Demetrius; and Pantazelos, Theophanes G., to Lodding Engineering Corporation. Stress relief in solid materials. 3,677,831, Cl. 148-12.900.
Pfaff, William A.: *See*—
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Pfeiffer, Francis R.; and Weisbach, Jerry A., to Smith Kline & French Laboratories. Adamantyl-substituted-alkyl 2-aminoethyl phosphates and phosphonates. 3,678,137, Cl. 260-944.000.
Pfister, Alain: *See*—
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Pflanz, Herbert M., to Allis-Chalmers Manufacturing Company. Electrical resistor. 3,678,435, Cl. 338-263.000.
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Pickett, Charles G.; Lang, Robert A.; and Comers, Robert C., to Bio-Medical Sciences, Inc. Dispenser for disposable type thermometers. 3,677,866, Cl. 156-584.000.
Pickles, Wilfred, to Ciba-Geigy Corporation. Tin-plating method and electrolyte. 3,677,910, Cl. 204-54.00r.
Pidebois, Jacques Eloi: *See*—
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Pierlot, Michel Eugene, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Carburetion devices for internal combustion engine. 3,677,526, Cl. 261-23.00a.
Pietschmann, Helmut Richard, to Sybron Corporation. Speed control for dental handpieces. 3,676,931, Cl. 32-27.000.
Pihl, George E., to Miniature Electronic Components Corporation. Electromagnetic indicator. 3,678,426, Cl. 335-234.000.
Pike, John A.: *See*—
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Pleich, John D.: *See*—
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Plenge, Richard D., to United States of America, Navy. Waterproof sound, flash and recoil suppressor for firearms. 3,677,132, Cl. 89-14.00b.
Plessey BTR Limited: *See*—

Davis, John Christopher Hammond, 3,677,098.
Plessey Company Limited, The: *See—*
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Pointout, Rene; Rouvet, Jacques; and Joliot, Adolphe. Three-way solenoid-operated valves. 3,677,826, Cl. 137-596.16.
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Popper, Jay D., to General Instrument Corporation. Self-biasing inverter. 3,678,293, Cl. 307-214.000.
Porter, David H.; and Biscoe, Thomas S., to Thomas Industries Inc. Lighting fixture support. 3,678,265, Cl. 240-84.000.
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Porter, Roy Donald, to Eastman Kodak Company. Method and apparatus for processing photographic film. 3,677,163, Cl. 95-90.500.
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Pouwels, Edward M.; and Roberts, James K., to Bendix Corporation, The. Adaptive braking control valve. 3,677,610, Cl. 303-21.00f.
Powel, William Sydney, to Redland Tiles Limited, mesne. Apparatus for advancing pallets for making tiles. 3,677,686, Cl. 425-452.000.
Power, Basil Dixon: *See—*
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Price, Franklin Carr. Method and apparatus for scrubbing gases. 3,676,982, Cl. 55-95.000.
Price, Paul B.: *See—*
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Prigal, Samuel J. Method of enhancing the action of a medicament. 3,678,149, Cl. 424-8.000.
Prikryl, Walter F.; and Gulick, Ronald A., to Research Engineering Company. Disengageable manual control. 3,677,108, Cl. 74-625.000.
Prill, Robert S., to Singer Company, The, mesne. Circuit for converting an unknown analog value into a digital value by successive approximations. 3,678,501, Cl. 340-347.0ad.
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Protas, Arthur I., to Cartridge Television, Inc. Tape cartridge construction. 3,677,494, Cl. 242-194.000.
Protzman, Thomas F., to Staley, A. E., Manufacturing Company. Method of dry powder etching. 3,677,756, Cl. 96-36.000.
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Pucher, Walter, to Allmanna Svenska Elektriska Aktiebolaget. Circuit breaker for high voltage direct current. 3,678,335, Cl. 317-11.00a.
Puhk, Heino, to SCM Corporation. Soluble alkali metal salt removal from substantially non-polar liquids. 3,678,097, Cl. 260-486.00r.
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Raban, Joachim; Erxleben, Ewald; and Wildenau, Wolfgang. Process for making tobacco smoke filters. 3,677,806, Cl. 117-104.00r.
Rabilloud, Guy; Sillion, Bernard; and De Gaudemaris, Gabriel, to Institut Francais du Petrole des Carburants et Lubrifiants. Mixed imide-isoindoloquinazolinediones heterocyclic polymers. 3,678,005, Cl. 260-47.0cp.
Rabinow, Jacob; Rotkin, Israel; and Astin, Allen V., to United States of America, Army. Proximity fuzes. 3,677,184, Cl. 102-70.20p.
Race, Andras, to Marvin Glass & Associates. Child's occupant propelled riding toy roundabout. 3,677,541, Cl. 272-33.00r.
Radek, John R., to Ready Metal Manufacturing Co. Cantilever merchandise support. 3,677,415, Cl. 211-59.000.
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Ragen, Robert A.; Herendeen, Carl E.; and Wood, Gary R., to Singer Company, The. Zero suppression circuit. 3,678,471, Cl. 340-172.500.

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Ram, Michael J.; Riggs, John P.; and Clarke, Charles M., to Celanese Corporation. Process for the carbonization of a stabilized acrylic fibrous material. 3,677,705, Cl. 23-209.100.

Ramsey, Roy L. Insecticide distribution system. 3,676,949, Cl. 43-124.000.

Ramspeck, Howard B.; and Obergfell, Allen R., to Fastener Corporation. Safety for fastener driving tool. 3,677,456, Cl. 227-8.000.

Ramspeck, Howard B.; and Novak, Raymond F., to Fastener Corporation. Safety for fastener driving tool. 3,677,457, Cl. 227-8.000.

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Rasmussen, Ole-Bendt. Extruded sheet material. 3,677,873, Cl. 161-109.000.

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Rausing, Anders Ruben, to Sobrefina SA. Combined package containing an enclosed gaseous atmosphere for preservation. 3,677,774, Cl. 99-171.00b.

Rautine, Donald E., to Lord Corporation. Slitting apparatus having independent resiliently supported anvil means. 3,677,122, Cl. 83-506.000.

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Ray-Chaudhuri, Dilip K.; and Stockmann, Hans H., to National Starch and Chemical Corporation. Carboxamido-aziridine compounds. 3,678,035, Cl. 260-239.00e.

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Reams, William H., to United States of America, Navy. Arming device. 3,677,185, Cl. 102-78.000.

Reber, Robert L.; and Huiskens, James C., to Communications Transistor Corporation. Method and apparatus for etching fine line patterns in metal on semiconductive devices. 3,678,348, Cl. 317-235.000.

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Reeves, Richard A., to Sherwood Medical Industries Inc. Iontophoresis electrode. 3,677,268, Cl. 128-172.100.

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Regneault, Marcel; and Le Creurer, Maurice, to Automobiles Peugeot. Fuel injection device for an internal combustion engine. 3,677,256, Cl. 123-326.000.

Reidmann, Manfred; and Eichner, Martin, to Hewlett-Packard GmbH. Flame ionization detection apparatus and method. 3,677,709, Cl. 23-254.00e.

Reiling, Joseph W., to Woods, Charles, mesne. Built-in central vacuuming device. 3,676,986, Cl. 55-472.000.

Reim, Thomas E.; Pollack, Jerry J.; and Kemmerling, Robert A., to Republic Steel Corporation. Bulk density gage and bulk density control system. 3,678,268, Cl. 250-43.50d.

Reimer, William A., to GTE Automatic Electric Laboratories Incorporated. Methods of solenoid array memories. 3,676,923, Cl. 29-604.000.

Reimer, William A., to GTE Automatic Electric Laboratories, Inc. Wire clamp terminal clip of the flanged tubular type. 3,678,176, Cl. 174-94.00r.

Reimer, William A., to GTE Automatic Electric Laboratories Incorporated. Miniature crossbar switch. 3,678,422, Cl. 335-112.000.

Reiss, Stefan E., to Sylvania Electric Products, Inc. Method for fabricating multilayer magnetic devices. 3,677,843, Cl. 156-3.000.

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Renold, Adolph, to Colgate-Palmolive Company. Deodorization of fats. 3,678,084, Cl. 260-424.000.

Rensin, Ernest I., to International Telephone and Telegraph Corporation. Code compression system. 3,678,507, Cl. 340-347.0dd.

Rentz, John C., to United States of America, Army. Interchangeable tip for discrete dropping apparatus. 3,677,447, Cl. 222-193.000.

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Research Engineering Company: *See*—
Prikryl, Walter F.; and Gulick, Ronald A., 3,677,108.

Restivo, Francesco: *See*—
Serracchioli, Francesco; and Restivo, Francesco, 3,678,179.

Reulet, Philippe; Pfister, Alain; Tellier, Jacques; Blanc, Jean-Henry; Jorgensen, Kirsten Borre; and Bohlbro, Hans, to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine. Process for the preparation of unsaturated alphatic nitriles by the oxidation of olefins. 3,678,091, Cl. 260-465.300.

Reynolds Metals Company: *See*—
Mack, Grnat V., 3,676,905.
Watts, Richard M., 3,676,952.

Reynolds Metals Company, mesne: *See*—
Grosse, Aristid V., 3,677,326.

Reynolds Products Inc.: *See*—
Nitschneider, Robert M.; Neumann, Charles G.; and Krueger, Harvey R., 3,677,461.

Rheem Manufacturing Company: *See*—
Grolitzer, Arthur J.; and Mounts, Francis E., 3,678,459.

Rheinstahl Huttenwerke A.G.: *See*—
Wahlster, Manfred; and Choudbury, Alok, 3,677,323.

Rhines, Warren Joseph: *See*—
Lutchansky, Milton; and Rhines, Warren Joseph, 3,677,371.

Rice, Edwin Eugene; and Franklin, Charles Henry, to Chemotronics International, Inc. Method for the removal of unwanted portions of an article. 3,676,963, Cl. 51-320.000.

Rice, George A.: *See*—
Girard, Roland T.; and Rice, George A., 3,677,796.

Rich Manufacturing Company of California, mesne: *See*—
Page, Edward, 3,677,282.

Richards, Brian John, to Siebe Gorman & Company Limited. Closed circuit breathing apparatus. 3,677,267, Cl. 128-145.800.

Richards, William D., to American Optical Corporation. Magnetic belt recorder head adjustment. 3,678,210, Cl. 179-100.2ca.

Richardson, John H. Elastic pull type exerciser. 3,677,543, Cl. 272-82.000.

Richardson-Merrell, Inc.: *See*—
Binon, Fernand; and Beiler, Jay Morton, 3,678,063.

Richelmann, Bernd H.: *See*—
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., 3,677,401.

Richter, Sidney B.; and Levin, Alfred A., to Velsicol Chemical Corporation. Method for the control of aquatic plant life. 3,677,735, Cl. 71-66.000.

Rick, Edward A.; McKeon, James E.; Fitton, Peter; and Argento, Benny J., to Union Carbide Corporation. Process for making group

VIII metal cyanides and group VIII metal cyanide complexes. 3,678,085, Cl. 260-429.00r.

Rickert, Frank J.; and Pokorny, Frank J., to I-T-E Imperial Corporation. Self-aligning jaw contact. 3,678,237, Cl. 200-166.00e.

Riemhofer, Franz; Dittmann, Walter; Biethan, Uwe; Hornung, Karl-Heinz; and Schultze, Ernst-Christian, to Chemische Werke Huls Aktiengesellschaft. Coating compositions comprising a mixture of a polyester and an aminoplast. 3,678,128, Cl. 260-850.000.

Riggs, John P.: *See—*
Ram, Michael J.; Riggs, John P.; and Clarke, Charles M., 3,677,705.

Riley, John Edward, to General Electric Company. Ratio controller with zero ratio capability. 3,678,373, Cl. 323-75.

Riley, Myrne R., to Monsanto Company. Fluid spinning process for novel yarns. 3,676,992, Cl. 57-164.000.

Ringle, Richard Bertrem, to Globe-Union Inc. Automatic battery charger with multiple rate charging. 3,678,363, Cl. 320-24.000.

Riordon, Peter R., to Chemcell Limited. Open celled polypropylene filament of improved uniformity. 3,677,881, Cl. 161-178.

Rioux, Christian Paul Gilbert: *See—*
Garnier, Michel Robert; and Rioux, Christian Paul Gilbert, 3,678,306.

Rissi, Erwin: *See—*
Ebnother, Anton; Bastian, Jean-Michel; and Rissi, Erwin, 3,678,058.

Ritter, George F., Jr., to Libbey-Owens-Ford Company. Glass sheet bending and tempering apparatus. 3,677,733, Cl. 65-268.000.

Rivers, Richard D.; Byers, Thomas W.; and Fortener, Edward J., to American Air Filter Company, Inc. Pressure relief valve. 3,677,289, Cl. 137-527.800.

Roberts, James K.: *See—*
Pouwels, Edward M.; and Roberts, James K., 3,677,610.

Roberts, Robert, to Fluorodynamics, Inc. Method for the in situ covering of large diameter process rolls with heat shrinkable films of fluorinated ethylene polymers and the like. 3,677,845, Cl. 156-3.000.

Robinson, Brian; and Fillingham, Stephen Harvey, to I.W.S. Nominee Company Limited and Ciba Limited. Method of milling and resin treating keratinous fibers. 3,677,693, Cl. 8-127.500.

Robinson, Charles A., to American Home Products Corporation. Process for producing α-amino penicillin intermediates. 3,678,037, Cl. 260-239.100.

Robison, James W.; and Eads, Harold L., to Ames, O.; Division of McDonough Company. Hedge Shears. 3,676,930, Cl. 30-257.000.

Rock, Erich, to Blum, Julius, Messrs. Connector for plates. 3,676,898, Cl. 24-73.0pd.

Rock, Salvatore J. Pre-tied necktie rack. 3,677,414, Cl. 211-13.000.

Rodgers, Thomas A.: *See—*
Hardesty, Donald E.; and Rodgers, Thomas A., 3,677,932.

Roeder, Paul J.: *See—*
Hoogendorn, Helen M.; Narken, Bernt; Roeder, Paul J.; and Sunners, Brian, 3,678,211.

Rohm and Haas Company: *See—*
Horrom, Bruce W.; Crovetti, Aldo J.; and Viste, Kenneth L., 3,677,739.
Lewis, Sheldon N.; Merritt, Richard F.; and Emmons, William D., 3,678,098.
Ryan, Charles Francis, 3,678,133.

Roles, David Jack, to Eastern Products Corporation. Field installation clip for exposed grid systems. 3,677,589, Cl. 287-189.36a.

Rolls-Royce Limited: *See—*
Denning, Ralph Murch, 3,677,501.
Higginbotham, Gordon John Spencer; and Hall, Douglas Wilson, 3,677,324.

Roos, Robert R., to Mueller Co. Connection fitting for a pipe. 3,677,578, Cl. 285-162.000.

Root, James R.; and Hill, Thomas D., to Ruskin Manufacturing Company. Wrap-around damper frame. 3,677,517, Cl. 251-366.000.

Rose, Marion S., to Litton Systems, Inc. Deflectable light maser. 3,678,409, Cl. 331-94.500.

Rose, Nelson J. Loudspeaker balancing system. 3,678,202, Cl. 179-1.0at.

Rosen, Meyer R.; and Prokai, Bela, to Union Carbide Corporation. Method of extinguishing fires and compositions therefor containing cationic silicone surfactants. 3,677,347, Cl. 169-1.00a.

Rosenberg, Harold: *See—*
Hedberg, Frederick L.; and Rosenberg, Harold, 3,678,088.

Rosenberg, Peretz. Rotary pumps. 3,677,668, Cl. 418-45.000.

Rosenburgh, Norman J.: *See—*
Morse, John E.; and Rosenburgh, Norman J., 3,677,864.

Rosengart, Abraham M.: *See—*
Lichtman, Irwin A.; and Rosengart, Abraham M., 3,677,963.

Ross, Austin: *See—*
Barkman, Byron L.; Moe, William West; and Ross, Austin, 3,678,187.

Ross, George B.: *See—*
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., 3,677,401.

Rossmy, Gerd: *See—*
Koerner, Gotz; and Rossmy, Gerd, 3,677,962.

Rotasign Limited: *See—*
Johnson, Harold Hector; South, Derek Bye; and White, Charles Victor Burdett, 3,678,282.

Roth, Solo S. Means for projecting an enlarged television image. 3,678,196, Cl. 178-75.00d.

Roth, Wolfgang, to Deere and Company. Expansible chamber device with internal accumulator. 3,677,142, Cl. 92-60.000.

Rothmann, Harry Edward; and Ruf, Walter, to St. Regis Paper Company. Bag applicator method and apparatus. 3,676,977, Cl. 53-24.

Rotkin, Israel: *See—*
Rabinow, Jacob; Rotkin, Israel; and Astin, Allen V., 3,677,184.

Rottner, Emil; Bock, Franz; Muth, Willi; and Wenzel, Gunter. Process for making pipe bends of thermoplastic material. 3,678,146, Cl. 264-313.000.

Round, Kenneth J., to Atomic Energy of Canada Limited. Nuclear power source. 3,678,303, Cl. 310-3.00r.

Rousso, Jack J., Jr.; and Willman, George N., to Mobil Oil Corporation. Air distributor for obtaining uniform head-tape contact in magnetic tape transport. 3,678,216, Cl. 179-100.20p.

Rouvet, Jacques: *See—*
Pointout, Rene; Rouvet, Jacques; and Joliot, Adolphe, 3,677,826.

Rovnyak, Richard M., to Automatic Electric Laboratories Inc. Windings for operating efficiently contacts of reeds with constricted areas. 3,678,423, Cl. 335-154.000.

Rowe, Alan C.: *See—*
Furlong, Owen D.; Rowe, Alan C.; and Wright, Eric F., 3,677,293.

Rowley, Martin E.: *See—*
Bishop, John F.; Hunter, Walker F., Jr.; and Rowley, Martin E., 3,677,790.

Rowsam, Kenneth P.; and Yost, De Witt M., to Sorg Paper Company, The. Anticounterfeit ticket. 3,677,887, Cl. 162-140.000.

Rubin, Jacob C.; and Sukel, Gerald J., to Eastman Kodak Company. Planar viscometer. 3,677,069, Cl. 73-56.000.

Rudenko, Nikolai Nikolaevich: *See—*
Gusev, Vladimir Alexeevich; and Rudenko, Nikolai Nikolaevich, 3,677,862.

Rudkin, Alva James, Jr.: *See—*
Hessler, Henry M., 3,677,313.

Ruf, Walter: *See—*
Rothmann, Harry Edward; and Ruf, Walter, 3,676,977.

Ruhle, Manfred: *See—*
Borgstedt, Hans-Ulrich; Ruhle, Manfred; and Wincierz, Peter, 3,677,723.

Ruhnau, Joachim. Machine for delivering multi-component plastics mixture. 3,677,442, Cl. 222-70.

Ruskin Manufacturing Company: *See—*
Root, James R.; and Hill, Thomas D., 3,677,517.

Russo, Paul, to Polyflon Corporation. Capacitor. 3,678,349, Cl. 317-243.000.

Rutkowski, Beverly J., to Whirlpool Corporation. Method to prevent glassware etching in a dishwasher. 3,677,820, Cl. 134-25.00a.

Ruttkay, Adam: *See—*
Hvidtfeldt, Niels; and Ruttkay, Adam, 3,678,345.

Ryan, Allen L.: *See—*
Vail, Thomas W.; and Ryan, Allen L., 3,677,555.

Ryan, Charles Francis, to Rohm and Haas Company. Modified vinyl halide polymers. 3,678,133, Cl. 260-876.00r.

Rymas, Frank, to Walmet Corporation, The. Cemented carbide composition and method of preparation. 3,677,722, Cl. 29-182.800.

Rys, Tadeusz J., to Square D Company. Motor starter unit with interlock means for selectively mountable circuit breaker operating mechanism. 3,678,230, Cl. 200-50.00a.

Saam, John C.; and Fearon, Frederick W. G., to Dow Corning Corporation. Siloxane containing thermoplastic. 3,678,125, Cl. 260-827.000.

Saam, John C.; and Fearon, Frederick W. G., to Dow Corning Corporation. Siloxane containing thermoplastic elastomers. 3,678,126, Cl. 260-827.000.

Sagami Chemical Research Center: *See—*
Fujisawa, Tamotsu; Yamamoto, Mizuo; and Tsuchihashi, Genichi, 3,678,115.

Sagawa, Burt K., to Minnesota Mining and Manufacturing Company. Reflective platen. 3,677,643, Cl. 355-91.000.

Sager, Karl E., to Kimberly-Clark Corporation. Method for applying adhesive to cross threads while crosslaying. 3,677,854, Cl. 156-173.000.

Saito, Jiro: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; and Suzuki, Masao, 3,677,857.

Saito, Morio: *See—*
Arimura, Tohru; Kamata, Masamoto; Saito, Morio; Suzuki, Hiromu; and Iguchi, Masakazu, 3,677,045.

Sakaguchi, Mitsuhito: *See—*
Nishida, Nobuo; and Sakaguchi, Mitsuhito, 3,677,622.

Sakai, Katsuo: *See—*
Ohta, Wasaburo; and Sakai, Katsuo, 3,677,751.

Sakashita, Masahira: *See—*
Fukuma, Noboru; Kobayashi, Hidehiko; Matsui, Kenichi; Sakashita, Masahira; and Henmi, Hiroshi, 3,677,880.

Saligny, Claude: *See—*
Bolliand, Robert; and Saligny, Claude, 3,677,855.

Salomon, Georges P. J. Low friction bearing arrangement for ski boot in contact with a ski. 3,677,567, Cl. 280-11.35c.

Samelson, Harold: *See—*
Brecher, Charles; Pappalardo, Romano; and Samelson, Harold, 3,677,959.
Kocher, Robert C.; Moore, Franklin K.; Samelson, Harold; and Watson, William R., 3,678,410.

Samoilenko, Svetlana Mikhailovna: *See—*
Scherban, Alexandr Nazarievich; Furman, Neonil Izrailevich; Sotnichenko, Boris Feodosievich; Belogolovin, Nikolai Stefanovich; Chopovsky, Jury Ivanovich; Sutormin, Jury Nikolaevich; Zaitsev, Valentin Ivanovich; Kot, Vladimir Ivanovich; Mikhailjuk, Nikolai Tarasovich; Denisenko, Sergei Andreevich; Chaschinov, Anatoly Vasilievich; Shaporev, Stepan Vasilievich; and Samoilenko, Svetlana Mikhailovna, 3,678,489.

Sanders Associates, Inc.: *See—*
Blitz, Daniel, 3,677,101.
Misek, Victor A., 3,677,647.

Sandler, Stanley R., to Borden Company, The. Polyvinyl acetate adhesives containing inorganic zirconium salts. 3,677,883, Cl. 161-251.000.

Sandoz A.G.: *See—*
Ebnother, Anton; Bastian, Jean-Michel; and Gadient, Fulvio, 3,678,057.
Ebnother, Anton; Bastian, Jean-Michel; and Rissi, Erwin, 3,678,058.
Gagnaux, Pierre, 3,678,050.

Sandoz Ltd.; a/k/a: *See—*
Ebnother, Anton; Bastian, Jean-Michel; and Gadient, Fulvio, 3,678,057.
Ebnother, Anton; Bastian, Jean-Michel; and Rissi, Erwin, 3,678,058.
Gagnaux, Pierre, 3,678,050.

Sandoz-Wander, Inc.: *See—*
Houlihan, William J., 3,678,111.
Kathawala, Faizulla G., 3,678,166.

Sanford, Lloyd Clifford, to Itek Corporation. Sensitometer light source apparatus. 3,677,150, Cl. 95-10.00r.

Sannomiya, Isao: *See—*
Sugimoto, Yoshitaka; Sannomiya, Isao; and Noumi, Kazunobu, 3,677,694.

Sansui Electric Co., Ltd.: *See—*
Takahashi, Susumu, 3,678,297.

Santa Fe International Corporation: *See—*
Lloyd, Samuel H.; and Santa Fe International Corporation, 3,677,352.

Santerre, Fernand; and Libaud, Francis, to La Telemecanique Electrique. Thread-sensing device for a textile machine. 3,676,990, Cl. 57-81.000.

Sanyo Electric Co., Ltd.: *See—*
Narita, Fujiaki, 3,678,186.
Yasuoka, Yoshio; and Shirakami, Yoshiaki, 3,678,238.

Sarff, Forest M.; and Birch, Silas B., Jr. Power-driven wire tying mechanism. 3,677,308, Cl. 140-93.600.

Sarto, Jorma O., to Chrysler Corporation. Crankcase ventilation. 3,677,240, Cl. 123-119.00b.

Sasaki, Hiromi: *See—*
Hayashi, Yoshiki; Sasaki, Hiromi; and Matsumura, Toichi, 3,677,816.

Sasaki, Kenichi: *See—*
Harada, Motoo; and Sasaki, Kenichi, 3,677,238.

Satas, Wallace J.: *See—*
Foley, John J.; Satas, Wallace J.; and Konkel, Joseph, 3,677,176.

Sato, Akira: *See—*
Nadazawa, Yoshiyuki; Nakamura, Yashuharu; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,677,765.

Sato, Kunio; Sugihara, Kanji; Wakabayashi, Takashi; and Ishida, Tomio, to Matsushita Electric Industrial Co., Ltd. Method for making molded carbon composition resistors. 3,676,925, Cl. 29-613.000.

Sato, Masamichi: *See—*
Matsumoto, Seiji; Sato, Masamichi; and Fukushima, Osamu, 3,678,350.

Sato, Naotake: *See—*
Ariyoshi, Yasuo; Yamatani, Tetsuo; Uchiyama, Noboru; and Sato, Naotake, 3,678,026.

Sato, Seizi, to Sony Corporation. Magnetic recording and/or reproducing system having guide pins mounted on independently rotating plates for withdrawing tape from cassette. 3,678,213, Cl. 179-100.20z.

Savant Instruments, Inc.: *See—*
Meshbane, Alex; and Vilardi, Frank, 3,677,930.

Sawa, Kenneth B.; and Bleak, Thomas M., to Beckman Instruments, Inc. Temperature control circuit with zero average temperature offset error. 3,678,247, Cl. 219-501.000.

Sawazu, Toshihiko: *See—*
Oba, Harutaro; Sawazu, Toshihiko; Takeuchi, Sugio; and Yamaguchi, Norio, 3,677,464.

Saxon Industries, Inc.: *See—*
Van Auken, John; Kaufman, M. Gene; and Pfaff, William A., 3,677,637.
Van Auken, John A.; Kaufman, Mahlon Gene; and Blank, Fritz, 3,677,635.

Sayles, David C., to United States of America, Army. Composite propellant containing ballistic modifiers derived from metal chelates. 3,677,839, Cl. 149-19.000.

Scavuzzo, John J.: *See—*
Eig, Merrill; and Scavuzzo, John J., 3,677,063.

Schabert, Hans-Peter, to Siemens Aktiengesellschaft. Collecting device for cooling reactor core fragments in a fast breeder reactor. 3,677,892, Cl. 176-40.000.

Schacht, Louis L. Reversible closure. 3,676,955, Cl. 49-192.000.

Schaefer, Hans, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for the manufacture of butadiene derivatives. 3,677,914, Cl. 204-59.00r.

Schaefer, Hans, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of octadiene and dodecatrienes. 3,677,915, Cl. 204-59.00r.

Schaeffer, Bruce S.; and Pike, John A., to Frick Company. Evaporative condenser. 3,677,029, Cl. 62-305.000.

Schaeffer, Richard A., to Procter & Gamble Company, The. Apparatus and method for shingling articles of uniform non-planar shape. 3,677,391, Cl. 198-35.000.

Schaffstall, Eugene: *See—*
Weaver, Roger; and Schaffstall, Eugene, 3,677,827.

Schanke, Robert L., to Lincoln Tool & Manufacturing Co. Double needle winding head. 3,677,480, Cl. 242-1.10r.

Schanzer, Oswald: *See—*
Gansheimer, Josef; and Schanzer, Oswald, 3,677,946.

Schaus, Douglas I. Golf training device. 3,677,551, Cl. 273-183.00b.

Scheerer, Wolfgang, to Ehrenreich, A., & Cie. Ball joint for vehicle linkages. 3,677,585, Cl. 287-87.000.

Scheidweiler, Andreas: *See—*
Walthard, Beat; Scheidweiler, Andreas; and Kuhn, Max, 3,678,510.

Scheineman, John A.: *See—*
Bell, Howard F.; and Scheineman, John A., 3,677,292.

Schenher, Michel Bernard: *See—*
Bauger, Louis Jules; Beyler, Roland Robert Charles; Le Guen, Henri; Pidebois, Jacques Eloi; and Schenher, Michel Bernard, 3,677,013.

Scherban, Alexandr Nazarievich; Furman, Neonil Izrailevich; Sotnichenko, Boris Feodosievich; Belogolovin, Nikolai Stefanovich; Chopovsky, Jury Ivanovich; Sutormin, Jury Nikolaevich; Zaitsev, Valentin Ivanovich; Kot, Vladimir Ivanovich; Mikhailjuk, Nikolai Tarasovich; Denisenko, Sergei Andreevich; Chaschinov, Anatoly Vasilievich; Shaporev, Stepan Vasilievich; and Samoilenko, Svetlana Mikhailovna. Apparatus for determining the concentration of combustible gases and vapours. 3,678,489, Cl. 340-237.00r.

Schering Aktiengesellschaft: *See—*
Laurent, Henry; Kolb, Karl Heinz; and Wiechert, Rudolf, 3,678,034.

Scheu, Louis O., Jr.: *See—*
Parker, Samuel A.; and Wilding, Edwin L., 3,677,390.

Schiegg, Dallas L.: *See—*
Boothe, Jerry E.; Hoover, Merwin F.; and Schiegg, Dallas L., 3,678,110.

Schierding, Royce G.; and Tolbert, Tommy L., to Monsanto Company. Method for preparing metal molding compositions. 3,676,916, Cl. 29-419.000.

Schimmel, Karl F., to PPG Industries, Inc. Strippable unsaturated interpolymer compositions. 3,678,020, Cl. 260-80.780.

Schippers, Heinz; Geil, Walter; Albrecht, Gerd; and Jung, Reinhold, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Dies for producing multi-layer tubes or films. 3,677,863, Cl. 156-500.000.

Schlatter, Gerald Lance: *See—*
Miller, Charles Eveleigh; and Schlatter, Gerald Lance, 3,677,067.

Schlieckmann, Alfred: *See—*
Zippel, Bernd; and Schlieckmann, Alfred, 3,677,681.

Schlumberger Overseas Messgeratebau und Vertrieb GmbH: *See—*
Glathe, Wolfgang, 3,678,294.

Schmerling, Louis: *See—*
Vesely, Jerome A.; and Schmerling, Louis, 3,678,104.

Schmerling, Louis, to Universal Oil Products Company. Metal salts of halo-substituted polyhydropolycyclicdicarboxylic acids. 3,678,087, Cl. 260-435.00r.

Schmerling, Louis, to Universal Oil Products Company. Allylation or benzylation of aromatic compounds. 3,678,122, Cl. 260-671.00a.

Schmermund, Alfred. Arrangement for testing cigarettes. 3,677,068, Cl. 73-41.000.

Schmid, Rolf: *See—*
Lohse, Friedrich; Schmid, Rolf; Fisch, Willy; and Batzer, Hans, 3,678,009.

Schmid, Rolf; Lohse, Friedrich; and Batzer, Hans, to Ciba-Geigy AG. Carboxy terminated polyamides and diepoxides. 3,678,127, Cl. 260-830.00p.

Schmidt, Andreas; and Muller, Paul, to Ehrenreich, A., & Cie. Ball joint for vehicle linkages. 3,677,587, Cl. 287-87.000.

Schmidt, Ernst. Method and apparatus for rolling gear teeth or the like. 3,677,051, Cl. 72-78.000.

Schmidt, William G.: *See—*
Heers, Arthur F.; and Schmidt, William G., 3,678,389.

Schmidt, Wolfgang, to U.S. Philips Corporation. Heat trap for an air-cooled VHF power klystron. 3,678,327, Cl. 315-5.390.

Schneider, Louis: *See—*
Barabas, Eugene S.; Grosser, Frederick; and Schneider, Louis, 3,677,990.

Schneider, Marion F.; and Breen, Edward L., to United States of America, Air Force. Dosimetry system for measuring instantaneous dose and linear energy transfer spectrum of space radiations. 3,678,275, Cl. 250-83.60r.

Schneider, Raymond C., to Twin Disc, Incorporated. Aerodynamic torque converter. 3,677,003, Cl. 60-54.000.

Schober, Joachim: *See—*
Gottweis, Gert; Herrlich, Michael; Klas, Gunther; Schober, Joachim; Thiede, Peter; and Zachaus, Eberhard, 3,676,978.

Schoggen, Howard L., to Buckeye Cellulose Corporation, The. Slurry process for the production of absorptive carboxy methyl cellulose fibers. 3,678,031, Cl. 260-231.0cm.

Schon, Siegfried, to Siemens Aktiengesellschaft. Circuit arrangement for telephone private branch exchanges permitting conference calls between subscriber sets having video transmission. 3,678,207, Cl. 179-18.0bc.

Schramm, Richard F. Automotive oil crank case drain valve. 3,677,369, Cl. 184-1.500.

Schrank, Charles O.: *See—*
Schrank, Shirley L.; Berelc, John M.; Berelc, Dorothy C.; and Schrank, Charles O., 3,677,272.

Schrank, Shirley L.; Berelc, John M.; Berelc, Dorothy C.; and Schrank, Charles O. Cleaning device for beverage dispensers. 3,677,272, Cl. 134-93.000.

Schuette, Thomas L., to Possis Machine Corporation. Substrate transport means for skin packaging machines. 3,676,979, Cl. 53-112.00a.

Schuler, John Joseph, Jr.: *See—*
Aschkenasy, Herbert; Schuler, John Joseph, Jr.; and Bower, Jerry Efton, 3,677,984.

Schuller, James J., to Pullman Incorporated. Covered hopper car. 3,677,196, Cl. 105-377.000.

Schultz, Harold B.; Fulmer, Keith H.; and Burnett, Richard T. Hydraulic power brake system. 3,677,607, Cl. 303-10.000.

Schultz, John R., to Applied Power Industries, Inc. Directional valve control. 3,677,295, Cl. 137-596.120.

Schultze, Ernst-Christian: *See—*
Riemhofer, Franz; Dittmann, Walter; Biethan, Uwe; Hornung, Karl-Heinz; and Schultze, Ernst-Christian, 3,678,128.

Schurig, Robert E.; and Korn, Joseph, to Sonic Development Corporation of America. Pressure wave atomizing apparatus. 3,677,525, Cl. 261-1.000.

Schutte, Harry D., to Schutte Pulverizer Co., Inc. Metal trap for hammer mills or the like. 3,677,478, Cl. 241-82.000.

Schutte Pulverizer Co., Inc.: *See—*
Schutte, Harry D., 3,677,478.

Schwartz, Albert B.: *See—*
Sherry, Howard S.; and Schwartz, Albert B., 3,677,698.

Schwartz, Murray A.: *See—*
Ali, Mir Akbar; Schwartz, Murray A.; and Li, Pei Ching, 3,677,778.

Schwartz, Ralph E., to Redeco, Inc. Method for extending the useful storage period of biological substances such as blood. 3,677,022, Cl. 62-56.000.

Schwarzler, Hans-Jurgen, to Vereinigte Flugtechnische Werke-Fokker Gesellschaft mit beschrankter Haftung. Control flap arrangement. 3,677,504, Cl. 244-42.0cc.

Schwemin, Arnold J., to Optical Research and Development Corporation. Binoculars having stabilizing reflectors. 3,677,618, Cl. 350-16.000.

SCI Systems, Inc.: *See—*
Coe, Ronald J., 3,678,291.

SCM Corporation: *See—*
Meyers, Raymond E.; and Eubanks, Edgar W., 3,678,004.
Puhk, Heino, 3,678,097.

Scott Paper Company: *See—*
Gipe, Harry F., 3,677,178.

Scott, William Kenneth, to United States of America, Army. Method for the detection and classification of defects in internal combustion engines. 3,677,075, Cl. 73-117.300.

Scranton, Robert J.: *See—*
Parks, Miles E.; and Scranton, Robert J., 3,677,453.

Sealectro Corporation: *See—*
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Security Systems, Inc.: *See—*
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Segall, Paul E. Preservation and storage of biologic materials. 3,677,024, Cl. 62-64.000.

Segerkvist, Bror Henrik. Spring type disc projecting device with cam operated cocking mechanism. 3,677,257, Cl. 124-8.000.

Seiber, James N.; and Stringham, Robert R., to Dow Chemical Company, The. Electrolytic reduction of 1,2,3,4-tetrachlorobenzene to obtain 1,2,4-trichlorobenzene. 3,677,916, Cl. 204-59.00r.

Sekisui Kegaku Ogyo Kabushiki Kaisha: *See—*
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Serck Industries Limited: *See—*
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Serracchioli, Francesco; and Restivo, Francesco, to Olivetti, Ing. C., & C., S.p.A. Terminal apparatus. 3,678,179, Cl. 178-4.100.

Setser, Donald D., to Dow Chemical Company, The. Sleep sensing apparatus for use on automotive vehicles. 3,678,494, Cl. 340-279.000.

Sexton, Edwin Leon: *See—*
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Shaefer, Lewis H.: *See—*
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Shannon, James William, to Vickers Hoskins Pty., Limited. Self aligning latching mechanism on a cargo container spreader. 3,677,599, Cl. 294-67.0da.

Shapiro, Leonard, to Pennwalt Corporation. Rotary press. 3,677,673, Cl. 425-78.000.

Shaporev, Stepan Vasilievich: *See—*
Scherban, Alexandr Nazarievich; Furman, Neonil Izrailevich; Sotnichenko, Boris Feodosievich; Belogolovin, Nikolai Stefanovich; Chopovsky, Jury Ivanovich; Sutormin, Jury Nikolaevich; Zaitsev, Valentin Ivanovich; Kot, Vladimir Ivanovich; Mikhailjuk, Nikolai Tarasovich; Denisenko, Sergei Andreevich; Chaschinov, Anatoly Vasilievich; Shaporev, Stepan Vasilievich; and Samoilenko, Svetlana Mikhailovna, 3,678,489.

Shaw, Graham C.; and Reed, Russell, Jr., to Thiokol Chemical Corporation. Pyrotechnics comprising oxide of silver for weather modification use. 3,677,840, Cl. 149-19.000.

Shaw, Jeffery Isaac, to Lucas, Joseph, Industries Limited. Mounting arrangement for a board which supports electrical conductors. 3,678,342, Cl. 317-100.000.

Shay, Edward Griffin; and Tavss, Edward A., to Millmaster Onyx Corporation. Bactericidal quarternary ammonium derivatives of indene. 3,678,173, Cl. 424-329.000.

Shaye, Nat, to Baxter Laboratories Inc. Air block prevention system. 3,677,242, Cl. 128-214.00c.

Shearer, Bruce. Musical rolling hoop. 3,676,951, Cl. 46-114.000.

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Bell, Howard F.; and Scheineman, John A., 3,677,292.
Hardesty, Donald E.; and Rodgers, Thomas A., 3,677,932.
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Martin, Godfrey Q., 3,677,528.
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Shelton, James R.; and Hopper, Roger J., to Goodyear Tire & Rubber Company, The. Inhibiting premature vulcanization of rubbers. 3,678,017, Cl. 260-79.50b.

Shelton, Winston L.; and Pottinger, Eugene A., to Commercial Appliances, Inc. Pressure cooking apparatus. 3,677,170, Cl. 99-337.000.

Shemanske, Richard, to Borg-Warner Corporation. Master-slave motor system with start-up control circuit. 3,678,351, Cl. 318-61.000.

Shen, Tsung-Ying; Witzel, Bruce E.; and Walford, Gordon L., to Merck & Co., Inc. Substituted anilino carboxylic acids. 3,678,094, Cl. 260-471.00r.

Sheridan, John L., to Weyerhaeuser Company. Method of manufacturing consolidated articles by the use of steam atomized wax. 3,677,808, Cl. 117-105.300.

Sherry, Howard S.; and Schwartz, Albert B., to Mobil Oil Corporation. Low temperature-high temperature two stage ion exchange of zeolites. 3,677,698, Cl. 23-112.000.

Sherwin-Williams Company, The: *See—*
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Shimamura, Isao: *See—*
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Shimizu, Kunio: *See—*
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Shipley, Charles Raymond; Gulla, Michael; and Dutkewych, Oleh Borys, to Shipley Company, Inc. Electroless plating solutions for cadmium and cadmium copper alloys. 3,677,776, Cl. 106-1.000.

Shipley Company, Inc.: *See—*
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Shirvany, John Anoush, to Jackson, Byron, Inc. Dock fender structure. 3,677,017, Cl. 61-48.000.

Shively, John J. Anti-slip apparatus. 3,676,940, Cl. 36-8.100.

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Shotmeyer, Albert. Manually operable elevator. 3,677,367, Cl. 182-136.000.

Shoup, Robert D., to Corning Glass Works. Silicate bodies containing coprecipitated oxides. 3,678,144, Cl. 264-42.000.
Showalter, William E., to Union Oil Company of California. Method for improving the injection profile of a water injection well. 3,677,343, Cl. 166-252.000.
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Shteinshleifer, Boris. Jewelry bracelet catch. 3,676,904, Cl. 24-265.0ws.
Shubkin, Ronald L.: *See—*
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Shuey, Scott James, to Borg-Warner Corporation. Machinery shaft radial position monitor/alarm system. 3,678,493, Cl. 340-269.000.
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Sibilia, Alfred F. Two-part cartridge magazine. 3,676,946, Cl. 42-50.000.
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Siegfried, Edward C.; Harwell, Conner J.; and Murphy, Shields; deceased (by Friley, Paul B.), to Dickey, W. S., Clay Manufacturing Company. Apparatus for ram forming monolithic plastic articles. 3,677,687, Cl. 425-457.000.
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Simonetta, Enrico, to USAG S.p.A. Free-wheel device for transmitting torques and reversible ratchet dog comprising same. 3,677,102, Cl. 74-143.000.
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Simpson, Allan R. Bass drum pedal assembly. 3,677,128, Cl. 84-422.000.
Simpson, Elswoth C., to Polylok Corporation. Method of and machine for making fabrics. 3,677,034, Cl. 66-84.000.
Simpson, Samuel W., to Shell Oil Company. Apparatus for automatic crystal point detection. 3,677,064, Cl. 73-17.00r.
Sinclair, William: *See—*
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Singer Company, The: *See—*
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Sirota, Julius; Bentley, David J., Jr.; and Jubilee, Benjamin D., Jr., to National Starch and Chemical Corporation. Pressure sensitive adhesive compositions. 3,677,985, Cl. 260-27.00r.
Sisk, George William, Jr.; Miller, Arthur William; and Koleszar, Frank, to Whirlpool Corporation. Adjustable speed air drive-air sweep for air conditioner. 3,677,166, Cl. 98-94.000.
Sizer, Phillip S., to Otis Engineering Corporation. Pipe handling apparatus and method. 3,677,345, Cl. 166-315.000.
Skala, George F., to Environment/One Corporation. Self-adjusting condensation nuclei monitor measuring circuit having adjustable gain. 3,678,488, Cl. 340-236.000.
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Slayton, John W. Electric grass edger. 3,676,989, Cl. 56-10.500.
Slegten, Pierre Arsene. Automatic grading linings for cylindrical tube or similar mills. 3,677,479, Cl. 241-183.000.
Slone, Thomas J., to Procter & Gamble Company, The. Continuous thickness measurement of a moving plastic web. 3,676,933, Cl. 33-147.00l.
Slonimsky, Alexandr Borisovich: *See—*
Maximovich, Boleslav Ivanovich; Dudko, Daniil Andreevich; Agafonov, Nikolai Georgievich; Maximov, Igor Petrovich; Andreev, Vadim Grigorievich; Lepilov, Nikolai Yakovlevich; Svinov, Alexei Kapitonovich; Slonimsky, Alexandr Borisovich; Volk, Boris Zakharovich; Gubin, Alexandr Ivanovich; and Katsman, Berta Osipovna, 3,677,330.
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Smadar, Yechiel; and Goodman, Abraham H., to DCA Food Industries, Inc. Apparatus for despensing frozen comestibles. 3,677,443, Cl. 222-94.000.
Small, Fred, to Gullick Dobson Limited. Mine roof supports. 3,677,603, Cl. 299-31.000.
Smiernow, George A. Vacuum casting process. 3,677,332, Cl. 164-133.000.
Smith, Francis Hughes, to Vickers Limited. Optical field flattening devices. 3,677,621, Cl. 350-157.000.
Smith, Francis Rawdon; and Horne, John E. Duplicating apparatus for cassettes. 3,677,554, Cl. 274-3.000.
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Smith, Roy R., Jr., to Smith R. P. M. Corporation. Drive for controlling web length in rotary printing presses. 3,677,177, Cl. 101-228.000.
Smythe, Eric Patrick Greenwood, to Republic Mower Company (Proprietary) Limited. Rotary mower. 3,676,893, Cl. 15-328.000.
Snavely, Earl S., Jr.: *See—*
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Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine: *See—*
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Somogyi, Agnes: *See—*
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Souri, Hiroshi, to Iwatsu Electric Company, Ltd. Multi-color plasma display panel. 3,678,322, Cl. 313-201.000.

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Sparks, Allen K., to Universal Products Company. Stabilization of lubricants. 3,677,945, Cl. 252-49.600.

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Spivack, John Denon: *See—*
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Splatt, Reginald John Bingston, to United Kingdom of Great Britain and Northern Ireland, Minister of Technology in Her Britannic Majesty's Government of the. Cycloconverters. 3,678,369, Cl. 321-69.00r.

Spragg, Hal R., to U.S. Atomic Energy Commission under the provisions of 42 USC 2182. Treatment of sewage. 3,677,935, Cl. 210-3.000.

Springston, George B., Jr.; Thomas, Samuel L.; and Miller, Fred B., to United States of America, Navy. Knotmeter for small craft. 3,677,082, Cl. 73-181.000.

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Staar, Marcel Jules Helene, to Staar Development Co. Automatic stop mechanism for a recorder using magnetic tape stored in a cassette. 3,677,493, Cl. 242-191.000.

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Staar, Theophiel Clement Josef Lodewijk, to Staar, S.A. Storage box for tape-containing cassettes and the like. 3,677,396, Cl. 206-1.00r.

Staciokas, Leon: *See—*
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Starks, Karl H., Jr.: *See—*
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Stauffer Chemical Company: *See—*
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Stefanye, David. Process for the bluining of steel surfaces. 3,677,829, Cl. 148-6.350.

Stein, Leo. Transportable photographic enlarger. 3,677,636, Cl. 355-18.000.

Stein, Walter. Hypodermic syringe. 3,677,246, Cl. 128-218.00g.

Steinberg, David Herbert: *See—*
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Steinlein, Hans-Wolfgang, to Siemens Aktiengesellschaft. Code-responsive control receiving system. 3,678,460, Cl. 340-167.00r.

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Stepanov, Gennady Arkadievich; Tsailingold, Anatoly Lvovich; Pilipenko, Fedor Semenovich; Sodolev, Valerian Mikhailovich; Boreskov, Georgy Konstantinovich; Buyanov, Roman Alexeevich; and Venyaminov, Sergei Alexeevich. Process for the production of mono- and diolefin hydrocarbons. 3,678,124, Cl. 260-680.00e.

Stepenske, Lawrence D.; and Cassidy, Edward K., to National Can Corporation. Apparatus for coating articles. 3,677,226, Cl. 118-70.000.

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Field, George Francis; Sternbach, Leo Henryk; and Zally, William Joseph, 3,678,038.

Sterner, Maurice E., Jr.: *See—*
Taylor, Henry A.; and Sterner, Maurice E., Jr., 3,676,956.

Sterner, Russell L.: *See—*
Keller, Joseph H., Jr.; and Sterner, Russell L., 3,677,417.

Sterrett, Robert W.; and Jacob, Francis J., to Grace, W. R., & Co. Insulation product and method. 3,677,874, Cl. 161-116.000.

Stevens, Charles Edward, to Exton, John M.; as trustee of the Trust and Exton Development Company. Apparatus for ornamenting glass articles. 3,676,962, Cl. 51-227.00r.

Stevens, William P.; Hubbard, George M.; and Wagner, William D., to Bendix Corporation, The. Connector with isolated ground. 3,678,444, Cl. 339-130.00c.

Stevenson, Alan D.: *See—*
Burns, Erwin; and Stevenson, Alan D., 3,677,341.

Stewart, C. Jim, & Stevenson, Inc.: *See—*
Koomey, Paul C., 3,677,520.

Stewart, John Kenneth, to Tamper Inc. Reversible tamping bar. 3,677,187, Cl. 104-10.000

Stewart, Paul M.: *See—*
MacDuff, Richard; and Stewart, Paul M., 3,677,530.

Stewart Research, Inc.: *See—*
Maleck, Le Roy R., 3,676,895.

Stiles, Alvin B.: *See—*
McClellan, William R.; and Stiles, Alvin B., 3,678,139.

Stipek, Harold A. Loop-supporting device. 3,677,597, Cl. 294-19.00r.

Stirling, John Andrew: *See—*
MacPherson, Ian Alexander; Inman, Eric Richard; Stirling, John Andrew; and Irvine, Alexander McHugh, 3,677,782.

Stivers, Edward C., to Raychem Corporation. Poly(1,12-dodecamethylene pyromellitimide) and poly(1,13-tridecamethylene promellitimide) and radiation-crosslinked products thereof. 3,677,921, Cl. 204-159.190.

Stockmann, Hans H.: *See—*
Ray-Chaudhuri, Dilip K.; and Stockmann, Hans H., 3,678,035.

Stockwell, Orville E. Reversible differential control valve and systems. 3,677,137, Cl. 91-6.000.

Stoller, Arthur Irwin; and Opresko, Stephen Thomas, to RCA Corporation. Method and material for etching semiconductor bodies. 3,677,848, Cl. 156-17.000.

Stolzenwald, Ralf J.; and Korner, Peter, to Bosch, Robert, Photokino G.m.b.H. Motion picture camera with dissolving shutter and variable-focus lens. 3,677,625, Cl. 352-91.000.

Stone & Webster Engineering Corporation: *See—*
Dutkiewicz, Bronislaw K., 3,677,234.

Stout, Caleb M.; Nimerick, Kenneth H.; and Parks, Christ F., to Dow Chemical Company, The. Method of inhibiting wind movement of loose particles from surfaces. 3,677,014, Cl. 61-36.000.

Strange, Carl P.: *See—*
Liu, Gordon Y. T.; and Strange, Carl P., 3,678,024.

Strasser, Alois: *See—*
Kaiser, Wolfgang; Nitzsche, Siegfried; Wohlfarth, Ernst; Strasser, Alois; and Hittmair, Paul, 3,677,997.

Straub, Dieter: *See—*
Fischer, Gerd; Straub, Dieter; and Voigt, Heinz Eberhard, 3,678,301.

Strebel, Albert; and Habegger, Oskar, to Maschinenfabrik Burckhardt AG. Push rod for a crank drive mechanism. 3,677,107, Cl. 74-579.00r.

Stricker, Alfred A.: *See—*
Anzelone, Thomas A., Jr.; Larson, Harold A.; and Stricker, Alfred A., 3,677,853.

Stringham, Robert R.: *See—*
Seiber, James N.; and Stringham, Robert R., 3,677,916.

Strnat, Karl: *See—*
Ray, Alden E.; and Strnat, Karl, 3,677,947.

Stromberg-Carlson Corporation: *See—*
Boehly, Michael A., 3,678,222.
Collier, Robert W., 3,678,508.

Strong, Jerry G.; and Kaufman, Harold A., to Mobil Oil Corporation. 4-Oxoperhydrobenzo [b] thiophenes and their preparation. 3,678,070, Cl. 260-332.30p.

Strzepek, Edward S., to Lewis Spring & Manufacturing Co. Method of forming a double torsion spring and machine therefor. 3,677,054, Cl. 72-131.000.

Stuck, Klaus, to Ehrenreich, A., & Cie. Ball joint with cover plate for vehicles linkages. 3,677,586, Cl. 287-87.000.

Studley, David K., to Quantor Corporation. Microfilm camera. 3,677,159, Cl. 95-31.0el.

Stuemky, Robert E., to Gates Rubber Company, The. Continuously variable friction gear. 3,677,109, Cl. 74-796.000.

Sturm, Edward L., to Eastman Kodak Company. Control, signal and actuating mechanism for use with photoflash lamp units having pre-energized strikers. 3,677,157, Cl. 95-11.50r.

Subsea Equipment Associates Limited, mesne: *See—*
Dobler, Christian D.; and Lilly, Herbert J., Jr., 3,677,310.
Morgan, George W., 3,677,302.

Sudnick, Dennis J.: *See—*
Davis, Dennis J.; Sudnick, Dennis J.; Juhasz, John E.; and Kurichh, Sham, 3,677,609.

Sugahara, Eisuke, to Nippon Piston Ring Co., Ltd. Oil stripping piston ring. 3,677,558, Cl. 277-138.000.

Sugi, Masanao: *See—*
Ueda, Haruo; Sugi, Masanao; and Chayamichi, Hiroshi, 3,677,492.

Sugihara, Kanji: *See—*
Sato, Kunio; Sugihara, Kanji; Wakabayashi, Takashi; and Ishida, Tomio, 3,676,925.

Sugimoto, Kaname: *See—*
Kurimuto, Masashi; Sugimoto, Kaname; and Hirao, Mamoru, 3,677,896.

Sugimoto, Yoshitaka; Sannomiya, Isao; and Noumi, Kazunobu, to Kanegafuchi Boseki Kabushiki Kaisha. Imparting crease resistance to fibrous silk structures through treatment with gaseous formaldehyde. 3,677,694, Cl. 8-127.600.

Sukel, Gerald J.: *See—*
Rubin, Jacob C.; and Sukel, Gerald J., 3,677,069.

Sumitomo Chemical Company, Ltd.: *See—*
Yasui, Seimei; Hirooka, Masaaki; and Oshima, Teruo, 3,678,018.

Sumski, Stanley: *See—*
Panish, Morton B.; and Sumski, Stanley, 3,677,228.

Sun, Shan C.; and Raygor, Paul O., to Westinghouse Electric Corporation. Signal transmitting system for extra high voltage transmission line. 3,678,339, Cl. 317-58.000.

Sun, Yun-Chung, to Dow Chemical Company, The. Process for dehydrating acetic acid. 3,677,023, Cl. 62-58.000.

Sunds Aktiebolag: *See—*
Pettersson, Bengt Edvard, 3,677,040.

Sundstrand Data Control, Inc.: *See—*
Corey, Victor B., 3,677,086.
Thompson, Burton J., 3,678,374.

Sunners, Brian: *See—*
Hoogendorn, Helen M.; Narken, Bernt; Roeder, Paul J.; and Sunners, Brian, 3,678,211.

Surface Technology Corporation: *See—*
Van Thyne, Ray J.; and Rausch, John J., 3,677,832.

Sussman, Bernard J., to Worthington Biochemical Corporation. Treatment of herniated intervertebral discs of mammals. 3,678,158, Cl. 424-94.000.

Susuki, Rinnosuke; Hoshi, Hiroshi; Araki, Shinichi; and Ishii, Masao, to Raion Yushi Kabushiki Kaisha. Handle grips for carton boxes. 3,677,459, Cl. 229-52.00a.

Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; and Suzuki, Masao, to Raion Yushi Kabushiki Kaisha. Method for manufacture of corrugated boards. 3,677,857, Cl. 156-210.000.

Sutormin, Jury Nikolaevich: *See—*
Scherban, Alexandr Nazarievich; Furman, Neonil Izrailevich; Sotnichenko, Boris Feodosievich; Belogolovin, Nikolai Stefanovich; Chopovsky, Jury Ivanovich; Sutormin, Jury Nikolaevich; Zaitsev, Valentin Ivanovich; Kot, Vladimir Ivanovich; Mikhailjuk, Nikolai Tarasovich; Denisenko, Sergei Andreevich; Chaschinov, Anatoly Vasilievich; Shaporev, Stepan Vasilievich; and Samoilenko, Svetlana Mikhailovna, 3,678,489.

Sutton, Robert Anderson: *See—*
Arvay, Frank Joseph; Frieber, George; Lechleider, Joseph William; and Sutton, Robert Anderson, 3,678,379.

Suzuki, Hiromu: *See—*
Arimura, Tohru; Kamata, Masamoto; Saito, Morio; Suzuki, Hiromu; and Iguchi, Masakazu, 3,677,045.

Suzuki, Hisao; Musashi, Akira; Hiruta, Makoto; and Muramoto, Hiroo, to Nippon Soda Co., Ltd. Low temperature peroxide curable thermosetting polyurethane resin having terminal unsaturation. 3,678,014, Cl. 260-77.5cr.

Suzuki, Masao: *See—*
Susuki, Rinnosuke; Hoshi, Hiroshi; Saito, Jiro; and Suzuki, Masao, 3,677,857.

Suzuki, Tadao, to Sony Corporation. Transistor protective circuit. 3,678,408, Cl. 330-207.00p.

Suzuki, Toshio, to Nippon Seiko Kabushiki Kaisha. Shell type needle bearing. 3,677,032, Cl. 64-17.00a.

Suzuki, Tsuyoshi: *See—*
Yonemitsu, Eiichi; Isshiki, Tomiya; Suzuki, Tsuyoshi; and Yashima, Yukio, 3,678,107.

Suzuki, Zennosuke: *See—*
Morita, Ken-Ichi; Suzuki, Zennosuke; and Hirose, Hiromitsu, 3,678,093.

Svinov, Alexei Kapitonovich: *See—*
Maximovich, Boleslav Ivanovich; Dudko, Daniil Andreevich; Agafonov, Nikolai Georgievich; Maximov, Igor Petrovich; Andreev, Vadim Grigorievich; Lepilov, Nikolai Yakovlevich; Svinov, Alexei Kapitonovich; Slonimsky, Alexandr Borisovich; Volk, Boris Zakharovich; Gubin, Alexandr Ivanovich; and Katsman, Berta Osipovna, 3,677,330.

Svischev, Georgy Petrovich: *See—*
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Cheremukhin, Georgy Alexeevich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; and Mikeladze, Vitaly Georgievich, 3,677,502.

Swanke, Roy L.; and Raymond, Gordon H., to Dynamics Corporation of America. Multiple push button switch speed control system. 3,678,288, Cl. 307-113.000.

Swanke, Roy L.; and Raymond, Gordon H., to Dynamic Corporation of America. Multiple-push button switch speed control system. 3,678,357, Cl. 318-245.000.

Sweeney, Eric C.: *See—*
Meyers, Peter G.; Sweeney, Eric C.; and Brunkhardt, Frederick W., 3,677,422.

Sweeney, Richard F.: *See—*
Anello, Louis G.; and Sweeney, Richard F., 3,678,068.

Sweetheart Plastics, Inc.: *See—*
Davis, Paul, 3,677,435.

Swift Agricultural Chemicals Corporation, mesne: *See—*
Carroll, Robert L.; and Hayward, Charles R., 3,677,734.

Swift, Harold E.: *See—*
Bozik, John E.; Swift, Harold E.; and Wu, Ching-Yong, 3,677,968.
Bozik, John E.; Swift, Harold E.; and Wu, Ching Yong, 3,678,022.

Sybron Corporation: *See—*
Pietschmann, Helmut Richard, 3,676,931.

Sylvania Electric Products Inc.: *See—*
Cohen, Gerald; and Crystal, Maurice I., 3,678,205.
Gough, Warren G., 3,678,391.
Reiss, Stefan E., 3,677,843.

Szumski, Stephen Aloysius; and McCoy, Donald Walter, to American Cyanamid Company. Process for improving the stability of PPD, OT and histoplasmin on tine applicators. 3,678,150, Cl. 424-12.000.

Tabler, Donald C.: *See—*
Johnson, Marvin M.; and Tabler, Donald C., 3,677,933.

Tabler, James G.: *See—*
Greenspan, Gilbert; Curtis, Lawrence R.; Cunningham, Elmer E.; and Tabler, James G., 3,678,277.

Tabor, John R. Tunneling machine with concrete wall forming mechanism. 3,677,602, Cl. 299-31.000.

Taguchi, Seiichi: *See—*
Tamai, Yasuo; Osawa, Sadao; and Taguchi, Seiichi, 3,677,766.

Taguchi, Tatsuya, to Canon Kabushiki Kaisha. Interlocking device for the exposure meter in a camera. 3,677,149, Cl. 95-10.00c.

Takagi, Takeshi; Kawamoto, Tamio; and Miyazaki, Toshio, to Nissan Motor Company, Limited. Hydraulic clutch with dump valve. 3,677,381, Cl. 192-106.00f.

Takahashi, Hideomi; and Takigami, Katsuhiko, to Tokyo Shibaura Electric Co., Ltd. Starting control for an A.C. electric motor device. 3,678,361, Cl. 318-473.000.

Takahashi, Shigeo: *See—*
Hirozawa, Koichiro; and Takahashi, Shigeo, 3,677,277.

Takahashi, Susumu, to Sansui Electric Co., Ltd. Switching circuit. 3,678,297, Cl. 307-251.000.

Takebe, Kaoru: *See—*
Nakatani, Keiji; and Takebe, Kaoru, 3,677,640.

Takeda Chemical Industries, Ltd.: *See—*
Miyake, Akira; Horii, Stoshi; and Ueyanagi, Jisaburo, 3,678,160.
Naka, Jinshichi; Tokuda, Yasunori; Koono, Takehiko; and Utsugi, Jun, 3,677,773.
Shibata, Motoo; Yamamoto, Hiroichi; Higashide, Eiji; Mizuno, Komei; Imanishi, Mashiko; and Miyake, Akira, 3,678,161.

Takeda, Yosiaki, to Nippondenso Kabushiki Kaisha. Contact breaker incorporating fuel injection timing switches. 3,678,224, Cl. 200-19.00m.

Takei, Haruo: *See—*
Nadazawa, Yoshiyuki; Nakamura, Yashuharu; Takei, Haruo; Sato, Akira; and Ikeda, Tadashi, 3,677,765.

Takeuchi, James S.: *See—*
Hunton, James Keith; Kelly, Wayne M.; and Takeuchi, James S., 3,678,395.

Takeuchi, Sugio: *See—*
Oba, Harutaro; Sawazu, Toshihiko; Takeuchi, Sugio; and Yamaguchi, Norio, 3,677,464.

Takigami, Katsuhiko: *See—*
Takahashi, Hideomi; and Takigami, Katsuhiko, 3,678,361.

Takimoto, Syozo. Marine propulsion device. 3,677,217, Cl. 115-31.000.

Takishima, Yoshiyuki: *See—*
Kitanosono, Tatsushi; Mashimo, Yukio; and Takishima, Yoshiyuki, 3,678,354.

Talley, James C., to United States of America, Navy. Pre-shaped fragmentation device. 3,677,183, Cl. 102-67.000.

Tamai, Yasuo; Osawa, Sadao; and Taguchi, Seiichi, to Fuji Photo Film Co., Ltd. Method of forming gelatin image. 3,677,766, Cl. 96-164.000.

Tamate, Tokutaro; Yagi, Eiichi; and Ikeda, Hisayuki, to Kabushikikaisha Yokogawa Denki Seisakusho. Apparatus for measuring pH. 3,677,925, Cl. 204-195.00r.

Tamburrino, James F.: *See—*
McFarland, Otho K.; and Tamburrino, James F., 3,678,375.

Tamper Inc.: *See—*
Stewart, John Kenneth, 3,677,187.

Tamplen, Jack W. Reversible arming method and apparatus for emplacing a locking device in tubing. 3,677,346, Cl. 166-315.000.

Tanaka, Ryohei, to Lion Fat & Oil Co., Ltd. Method for reconditioning the surface of plastics. 3,677,821, Cl. 134-42.000.

Tanguay, Jean Paul, to Placements Jean Paul Tanguay Limited, mesne. Slasher for cutting tree stems into logs of selected length. 3,677,312, Cl. 143-46.00f.

Tani, Haruhisa: *See—*
Yazawa, Masahide; and Tani, Haruhisa, 3,677,484.

Taniguchi, Kaname; Furukawa, Fujio; Hisatome, Tomiro; and Kimura, Yoshito, to Mitsubishi Jukogyo Kabushiki Kaisha. Propeller with kort nozzle. 3,677,660, Cl. 415-172.000.

Taplin, Lael B., to Bendix Corporation, The. Fluid oscillator for a linear output accelerometer. 3,677,095, Cl. 73-515.000.

Tarrant, Fred K., Jr.: *See—*
Murray, Gregory J.; and Tarrant, Fred K., Jr., 3,676,891.

Tarrant Manufacturing Company: *See—*
Murray, Gregory J.; and Tarrant, Fred K., Jr., 3,676,891.

Tatar, Frank J., to Comon Tatar Inc. Puzzle postcard. 3,677,399, Cl. 206-46.0am.

Taub, Bernard: *See—*
Hino, John Bernhard; and Taub, Bernard, 3,678,011.

Tavss, Edward A.: *See—*
Shay, Edward Griffin; and Tavss, Edward A., 3,678,173.

Taylor, Clarence R.: *See—*
Knowles, Frederick G.; and Taylor, Clarence R., 3,677,487.

Taylor, Edward B.: *See—*
Holt, Thomas E.; and Taylor, Edward B., 3,677,850.

Taylor, Henry A.; and Sterner, Maurice E., Jr., to Dinsmore, D. J., Co. Readily removable window with weather-stripping. 3,676,956, Cl. 49-446.000.

Taylor, Julian S. Flying shear. 3,677,119, Cl. 83-316.000.

Taylor, Keith M., to Monsanto Company. Ammoxidation of saturated hydrocarbons. 3,678,090, Cl. 260-465.300.

Technical Management Services, Inc.: *See—*
Gilbert, Roswell W., 3,678,495.

Technical Operations, Incorporated: *See—*
Heinonen, Russell M., Jr., 3,677,629.

Tecumseh Products Company: *See—*
Pawlina, Julian S., 3,677,364.

Teledyne, Inc., mesne: *See—*
Hollmann, Walter G.; and Lozo, Frederick M., III, 3,677,786.

Teletype Corporation: *See—*
Heneghan, Patrick J., 3,678,295.

Tellier, Jacques: *See—*
Reulet, Philippe; Pfister, Alain; Tellier, Jacques; Blanc, Jean-Henry; Jorgensen, Kirsten Borre; and Bohlbro, Hans, 3,678,091.

Tempel, George F., to Electronic Associates Inc. Stabilized direct coupled amplifier having improved frequency response and minimun intermodulation distortion. 3,678,402, Cl. 330-9.000.

Temple, Hiram E., to Baker Perkins Inc. Bakery products handling apparatus. 3,677,393, Cl. 198-85.000.

Tenneco Chemicals, Inc.: *See—*
Hill, Ira D.; Mikherjee, Barid B.; and Brown, Dale G., 3,678,172.
Minieri, Pasquale P., 3,677,738.

Tenney, Horace M.: *See—*
Mertzweiller, Joseph K.; and Tenney, Horace M., 3,677,969.
Mertzweiller, Joseph K.; and Tenney, Horace M., 3,677,970.

Tennis, Francis H., to Hydraulic Industries, Inc. Control valve and actuating lever assembly therefor. 3,677,281, Cl. 137-270.000.

Tenniswood, David M.: *See—*
Cork, Gordon H.; Tenniswood, David M.; and Kaptur, Robert E., 3,677,099.

Terazawa, Yoshizumi; and Ayaki, Kazuo, to Nippon Electric Company, Limited. Electron lens for convergence of plurality of beams. 3,678,317, Cl. 313-69.00r.

Texas Instruments, Incorporated: *See—*
Cash, John H., Jr.; and Cunningham, James A., 3,677,924.
Choate, William C.; and Masten, Michael K., 3,678,461.
Choate, William C.; and Masten, Michael K., 3,678,470.
Holton, William C., 3,678,400.

Th. Goldschmidt A.G.: *See—*
Koerner, Gotz; and Rossmy, Gerd, 3,677,962.
Ray, Alden E.; and Strnat, Karl, 3,677,947.

Tharman, Paul A., to Briggs & Stratton Corporation. Rectifier network assembly. 3,678,366, Cl. 321-8.00r.

Thatcher, Russell S., to Kelso Marine, Inc. Control arrangement for the male die of a hydraulic press brake. 3,677,009, Cl. 60-97.00e.

Theodorou, Dimitri G.: *See—*
Deradoorian, Bagdasar; Goodrich, George W.; and Theodorou, Dimitri G., 3,677,730.

Thermal Syndicate Limited: *See—*
Edwards, Frederick James, 3,676,970.

Theunissen, Matthias Johannes Joseph; and Verkuijlen, Wilhelmus Henricus Cornelis Gerardus, to U.S. Philips Corporation. Manufacturing semiconductor devices. 3,677,846, Cl. 156-8.000.

Thiede, Peter: *See—*
Gottweis, Gert; Herrlich, Michael; Klas, Gunther; Schober, Joachim; Thiede, Peter; and Zachaus, Eberhard, 3,676,978.

Thiel, Reinhard; and Ellendt, Gunther, to Halcon International, Inc. Process for the cleaning of plants which are used for the oxidation of saturated hydrocarbons in the presence of boron compounds. 3,677,819, Cl. 134-2.000.

Thiokol Chemical Corporation: *See—*
Shaw, Graham C.; and Reed, Russell, Jr., 3,677,840.

Thomas & Betts Corporation: *See—*
Cole, John M.; and Sinclair, William, 3,676,924.

Thomas, Bryan: *See—*
Bush, Richard Paul; and Thomas, Bryan, 3,677,977.

Thomas Industries Inc.: *See—*
Porter, David H.; and Biscoe, Thomas S., 3,678,265.

Thomas, Morton I. Tabbed anchoring tape means. 3,677,250, Cl. 128-348.000.

Thomas, Robert E. Pre-fab form for concrete. 3,677,512, Cl. 249-48.000.

Thomas, Samuel L.: *See—*
Springston, George B., Jr.; Thomas, Samuel L.; and Miller, Fred B., 3,677,082.

Thomas, William E., to Phillips Petroleum Company. Explosive device and container. 3,677,180, Cl. 102-24.00r.

Thomenius, Kai E., to United States of America, Army. Presettable frequency divider. 3,678,398, Cl. 328-48.000.

Thompson, Burton J., to Sundstrand Data Control, Inc. Servoed transducer system with current output circuit. 3,678,374, Cl. 323-90.000.

Thompson, William B.: *See—*
Jones, Rexford W.; and Thompson, William B., 3,677,759.

Thomson, Faulkner C. System for the detection and control of compressor stall. 3,677,000, Cl. 60-39.280.

Thum, Waldemar: *See—*
Bergmeyer, Hans Ulrich; Naher, Gotthilf; Thum, Waldemar; Lauerer, Albert; and Emmer, Rudolf, 3,677,901.

Tien, John K.; and Gamble, Robert P., to United Aircraft Corporation. Homogeneous nickel-base superalloy castings. 3,677,835, Cl. 148-32.500.

Tito, Kostag V. Ball valve. 3,677,283, Cl. 137-338.000.

Tkach, Khai Berkovich: *See—*
Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tkach, Khai Berkovich; and Chepurnoi, Nikolai Prokhorovich, 3,677,354.

Tokuda, Yasunori: *See—*
Naka, Jinshichi; Tokuda, Yasunori; Koono, Takehiko; and Utsugi, Jun, 3,677,773.

Tokyo Electric Co., Ltd.: *See—*
Oba, Harutaro; Sawazu, Toshihiko; Takeuchi, Sugio; and Yamaguchi, Norio, 3,677,464.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Iwasaki, Masahiro; Goto, Nobuyuki; Fujisaki, Hiroya; and Niwa, Kunihiko, 3,678,390.
Takahashi, Hideomi; and Takigami, Katsuhiko, 3,678,361.

Tolbert, Tommy L.: *See—*
Schierding, Royce G.; and Tolbert, Tommy L., 3,676,916.

Tolksdorf, Wolfgang, to U.S. Philips Corporation. Device for a method of growing monocrystals. 3,677,712, Cl. 23-273.000.

Tollefsrud, Warren H.; and Shriver, Edward W., to Midland-Ross Corporation. Work transfer apparatus. 3,677,423, Cl. 214-18.00r.

Tomaszewski, Thaddeus W.: *See—*
Brown, Henry; and Tomaszewski, Thaddeus W., 3,677,907.

Tomson, Arthur J.: *See—*
Passal, Frank; and Tomson, Arthur J., 3,678,055.

Tonsbeek, Christiaan Herman Theodoor: *See—*
Copier, Harald; and Tonsbeek, Christiaan Herman Theodoor, 3,678,064.

Toolmasters Limited: *See—*
Mattingly, Frederick William, 3,678,311.

Topecon, Inc.: *See—*
Wild, Albert F., 3,678,212.

Toray Industries, Inc.: *See—*
Morita, Ken-Ichi; Suzuki, Zennosuke; and Hirose, Hiromitsu, 3,678,093.

Torello, Daniel D.: *See—*
Dinenno, Philip A., Jr.; Bonk, Joseph S.; Conrad, Kenneth C.; Moore, Rodney S.; Lochman, Harry E.; and Torello, Daniel D., 3,677,658.

Tornich, Fulvio: *See—*
Pere, Carlo; and Tornich, Fulvio, 3,677,531.

Toth, Charles, to Applied Aluminum Research Corporation. Process for increasing the percentage of aluminum in aluminum-manganese alloys. 3,677,742, Cl. 75-68.00b.

Toth, John E.: *See—*
Chaparro, John J.; Ellis, Lowell V.; Meanor, Doyle W.; Morton, William D., Jr.; Richelmann, Bernd H.; Ross, George B.; and Toth, John E., 3,677,401.

Touval, Irving; and Altwicker, Elmar R., to Universal Oil Products Company. N-Haloimides of polyhalo substituted polyhydrocyclicdicarboxylic acids. 3,678,071, Cl. 260-326.00c.

Toy, Wing Noon: *See—*
Nussbaum, Eric; Toy, Wing Noon; and Woinsky, Melvin Neil, 3,678,467.

Travel Trim & Vent Co.: *See—*
Rapport, Jerry; and Frymire, Garold D., 3,676,954.

Traver, Darwin G.; and Herb, Carl C., to Carrier Corporation. Ceiling air terminal. 3,677,164, Cl. 98-40.00d.

Trecker, David J.: *See—*
Borden, George W.; and Trecker, David J., 3,678,073.

Trecker, David J.; and McKeon, James E., to Union Carbide Corporation. Oxidation process for the synthesis of hydroxy α-hydroxy esters. 3,678,096, Cl. 260-484.00r.

Trehub, Arnold. Reading device for the blind. 3,676,938, Cl. 35-35.00a.

Trepaez, Jean: *See—*
Fleuret, Louis; and Trepaez, Jean, 3,677,852.

Tricault, Gerard J.: *See—*
Tricault, Yves P.; and Tricault, Gerard J., 3,678,248.

Tricault, Yves P.; and Tricault, Gerard J. Household dish-heating appliance. 3,678,248, Cl. 219-525.000.

Triumph Werke: *See—*
Link, Manfred, 3,677,384.

Trocciola, John C., to United Aircraft Corporation. Fuel saturator for low temperature fuel cells. 3,677,823, Cl. 136-86.00c.

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Watson, Lloyd M.; and Birchall, William R., to National Distillers and Chemical Corporation. Apparatus for preparing dispersions of finely-divided alkali metal. 3,677,477, Cl. 241-31.000.
Watson, William R.: *See—*
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Wattiez, Gerard Charles Lucien, to Compagnie Industrielle de Precontrainte et d'Equipment des Constructions (C.I.P.E.C.). Expansion joint for road works. 3,677,145, Cl. 49-18.000.
Watts, Richard M., to Reynolds Metals Company. Lawn edging device. 3,676,952, Cl. 47-33.000.
Wayson, Andrew J.; and O'Connell, John T., to Merriman, Inc. Method of making a porous metal spinning ring. 3,676,917, Cl. 29-420.500.
Weather-Rite Inc.: *See—*
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Weatherston, Richard N., to Weather-Rite Inc. Staged heating and cooling system. 3,677,335, Cl. 165-12.000.

Weaver, Roger; and Schaffstall, Eugene, to Oxford Chemicals. Composition and method for blackening metal articles. 3,677,827, Cl. 148-6.14r.

Webb, Richard V., to Eastman Kodak Company. Solvent composition for liquid scintillation counting. 3,677,964, Cl. 252-364.000.

Weber, Carl L.; Wolk, Ronald H.; and Chervenak, Michael C., to Hydrocarbon Research, Inc. Phase separation of a gas-liquid-solid mixture. 3,677,716, Cl. 23-288.00e.

Weber, Karl-Heinz; Bauer, Adolf; Merz, Herbert; and Minck, Klaus, to Boehringer Ingelheim G.m.b.H. 7-Nitro-1H-1,5-benzodiazepine-2,4-(3H,5H)-diones. 3,678,033, Cl. 260-239.300.

Weckler, Gene P., to Fairchild Camera and Instrument Corporation. Optimum high gain-bandwidth phototransistor. 3,677,280, Cl. 317-235.000.

Wedel, Alfred W., to Cameron Iron Works, Inc. Apparatus for temporarily closing a pipeline. 3,677,575, Cl. 285-3.000.

Wedmore, William R., to GTE Automatic Electric Laboratories Incorporated. Electromagnetic relay operation monitor. 3,678,344, Cl. 317-137.000.

Weichbrodt, Bjorn; and Darrel, Bernard, to General Electric Company. Damage detection method and apparatus for machine elements utilizing vibrations therefrom. 3,677,072, Cl. 73-67.000.

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Weigele, Manfred: *See—*
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Weiss, Paul C., to Ambac Industries Incorporated. Material discharge control apparatus. 3,677,540, Cl. 222-23.000.

Welch, Joseph T., to Becton, Dickinson and Company. Self-contained disposable syringe. 3,677,245, Cl. 128-218.00s.

Welter, Leonard M.: *See—*
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Wenzel, Gunter: *See—*
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Werft, August R. Golf practice apparatus. 3,677,552, Cl. 273-184.00b.

Werner, Helmut Wilhelm Werner, to U.S. Philips Corporation. Ion source comprising a concave-shaped repeller. 3,678,267, Cl. 250-41.95b.

Werner, Lincoln Harvey; and De Stevens, George. 4-Trifluoromethylanthranilic acids. 3,678,039, Cl. 260-239.6.

Werner, Nickel; and Nikolaos, Christopoulos, to Leitz, Ernst, G.m.b.H. Electronic exposure time measuring circuit with time indicator and shutter control means. 3,677,151, Cl. 95-10.0ce.

Wesselink, Gustaaf Adolf; Holmes, Thomas; de Kock, Arie Jan Rudolf; and Goorissen, Jan, to U.S. Philips Corporation. Low-pressure sodium vapour discharge lamp. 3,678,315, Cl. 313-27.000.

West Point-Pepperell, Inc.: *See—*
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Westen, Dietmar: *See—*
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Cartwright, John Sutton; and Fuchs, Francis Joseph, Jr., 3,677,049.
Fuchs, Francis Joseph, Jr., 3,677,048.
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Westfall, James E., to Continental Can Company, Inc. Container closure. 3,677,431, Cl. 215-43.000.

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Whatley, Marvin E., to United States of America, Atomic Energy Commission. Method for reprocessing molten fluoride salt reactor fuels. 3,677,719, Cl. 23-325.000.

Wheable, Desmond, to Solartron Electronic Group Limited, The. Triple-slope analog-to-digital converters. 3,678,506, Cl. 340-347.0nt.

Wheeler, Mildred S., to McDonnell Douglas Corporation. Line replaceable unit control valve. 3,677,139, Cl. 91-384.000.

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White, Pierce H., Jr. Livestock insecticide applicator. 3,677,233, Cl. 119-157.000.

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Williams, Bill D. Wrist watch assembly. 3,677,449, Cl. 224-4.00e.

Williams, Dewey H.: *See—*
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Williams, Frank Ronald; Whitehead, Jack; Marshall, Jefferson; Conners, Alan; and Gosden, Derek Vernon, to British Titan Products Company Limited. Process of beneficiating titaniferous beach sand. 3,677,740, Cl. 75-1.000.

Williams, John G., to Worthington Corporation. Multi-stage pump and components therefor. 3,677,659, Cl. 415-111.000.

Williams, Robert M., to Genova Products. Plastic pipe fitting and closure. 3,677,301, Cl. 138-92.000.

Willis, Roger L., to Eastman Kodak Company. Automatic lamp changer and spare lamp indicator circuit. 3,678,286, Cl. 307-38.000.

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Wilson, Quintus C., to United States of America, Air Force. Satellite communications system. 3,678,387, Cl. 325-4.000.

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Yamamura, Katsumi; Miyasaka, Tsugumitsu; Hayashi, Shinichi; Yamamoto, Masao; and Matsubara, Yukio. Palladium-nickel alloy plating bath. 3,677,909, Cl. 204-43.000.
Yamashita, Sadahiko, to Matsushita Electric Industrial Company, Limited. Electro-optical converter using a pulse generating diode to generate signal having pulse repetition frequency according to light signal. 3,678,280, Cl. 250-213.000.
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Yang, Tung H.; and Spence, John H., to Pullman Incorporated. Draft sill arrangement for high capacity car. 3,677,198, Cl. 105-420.000.
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Yasuoka, Yoshio; and Shirakami, Yoshiaki, to Sanyo Electric Co., Ltd. High frequency heating apparatus. 3,678,238, Cl. 219-10.550.
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Young, Donald Allan, to Lucas, Joseph, (Industries) Limited. Pins for electrical connectors. 3,678,448, Cl. 339-217.00s.

Young, Donald G., to Dow Corning Corporation. Primer for adhesion of silicone rubber to metal. 3,677,998, Cl. 260-33.6sb.

Young, George Ralph, Jr., to American Chemical & Refining Company Incorporated. Adjustable frame for thin sheet electrodes. 3,677,929, Cl. 204-286.000.

Young, Herbert, to Kidde, Walter, & Company, Inc. Storage system. 3,677,202, Cl. 108-109.000.

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Zierak, Stephen J.; and Monteiro, Arnold J., to Metal Bellows Corporation. Low cost rotary shaft coupling and method of making same. 3,677,031, Cl. 64-13.000.

Zimmerman, Robert L.; Dennis, Kent S.; and Moore, Eugene R., to Dow Chemical Company, The. Fabrication of shaped articles crosslinked by chemical addition reactions. 3,678,016, Cl. 260-78.40d.

Zinn, Mortimer H., to United States of America, Army. Signal and noise separation utilizing zero crossing electron tube and circuit. 3,678,321, Cl. 313-78.000.

Zippel, Bernd; and Schlieckmann, Alfred, to Zippel, Richard, & Co., KG. Mould filling apparatus. 3,677,681, Cl. 425-145.000.

Zippel, Richard, & Co., KG: *See*—
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Zopff, Thomas E., to Burroughs Corporation. Dial type switch with improved leaf spring biased rotatable contact plate. 3,678,223, Cl. 200-11.00g.

Zukowski, Henry J. Surgical instrument illuminating endotracheal tube inserter. 3,677,262, Cl. 128-6.000.

Zwijsen, Wilhelmus Antonius Joseph Marie: *See*—
Blom, Dirk; Van Overbeek, Adrianus Johannes Wilhelmus Marie; and Zwijsen, Wilhelmus Antonius Joseph Marie, 3,678,404.

Zychal, Edward, to Zyco Manufacturing Inc. Method and apparatus for transferring a magnetic sound track to movie film. 3,677,860, Cl. 156-299.000.

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LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 18TH DAY OF JULY, 1972

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Arnold, Robert L., and J. P. VanderKooi, to Monsanto Co. Method of improving rubber to brass adhesion. T900,003, 7–18–72, Cl. 156—306.

Balle, Gerhard, W. Keberle, K. Kowalewski, and B. Zorn, to Farbenfabriken Bayer Atkiengesellschaft. Process for treating sheet materials with anionic aqueous Polyurethane dispersions. T900,008, 7–18–72, Cl. 260—29.4.

Baron, Donald J., and W. A. Snell, to United Aircraft Corp. Method of testing titanium alloys. T900,005, 7–18–72, Cl. 204—17.

Bloom, Melvin S., and A. R. Guevara. Sensitizers for light sensitive polymer compositions. T900,011, 7–18–72. Cl. 96—115.

Cossar, Bernard C.: *See*—
Reynolds, Delbert D., and Cossar. T900,001.

Davis, Thomas G., D. L. Nealy, and J. W. Reynolds. Process for removing metallic color producing contaminants from solutions of bis(beta-hydroxyethyl)terephthalate in ethylene glycol. T900,013, 7–18–72, Cl. 260—475.

Dunham, Kenneth R., and M. E. Yost. Ultraviolet absorptive masks. T900,009, 7–18–72, Cl. 96—115.

Du Pont de Nemours, E. I., and Co.: *See*—
Wielar, Jack B., II. T900,002.

Farbenfabriken Bayer Aktiengesellschaft: *See*—
Balle, Gerhard, Keberle, Kowalewski, and Zorn. T900,008.

Guevara, Alfredo R.: *See*—
Bloom, Melvin S., and Guevara. T900,011.

International Business Machines Corp.: *See*—
Perriens, Matthews P., and Williams. T900,006.

Keberle, Wolfgang: *See*—
Balle, Gerhard, Keberle, Kowalewski, and Zorn. T900,008.

Kowalewski, Karlheinz: *See*—
Balle, Gerhard, Keberle, Kowalewski, and Zorn. T900,008.

Lauderback, William H. Smoke suppressor. T900,004, 7–18–72, Cl. 23—2.

Monsanto Co.: *See*—
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Neal, Richard D. Acid modified polyester fibers dyed with basic dyestuffs. T900,007, 7–18–72, Cl. 8—168.

Nealy, David L.: *See*—
Davis, Thomas G., Nealy, and Reynolds. T900,013.

Perriens, Matthews P., and J. H. Williams, Jr., to International Business Machines Corp. Information storage and retrieval system and method. T900,006, 7–18–72, Cl. 340—172.5.

Reynolds, Delbert D., and B. C. Cossar. Aminomethylating agents and processes for preparing and using same. T900,001, 7–18–72, Cl. 260—244.

Reynolds, Jefferson W.: *See*—
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Shuman, David C. Blue colloidal silver imaging system. T900,010, 7–18–72, Cl. 96—50.

Snell, William A.: *See*—
Baron, Donald J., and Snell. T900,005.

United Aircraft Corp.: *See*—
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VanderKooi, John P.: *See*—
Arnold, Robert L., and VanderKooi. T900,003.

Wielar, Jack B., II, to E. I. du Pont de Nemours and Co. Optical fiber ribbon and method of manufacture. T900,002, 7–18–72, Cl. 350—96.

Williams, John H., Jr.: *See*—
Perriens, Matthews P., and Williams. T900,006.

William, John V. Photographic diffusion transfer elements, film units, and methods for processing same. T900,012, 7–18–72, Cl. 96—77.

Yost, Marshall E.: *See*—
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Zorn, Bruno: *See*—
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Bailey, Charles R., to F. F. Murphy. Double refuse can holder. Re. 27,437, 7–18–72, Cl. 280—47.19.

Crosby, Stephen A. Tying implement and method. Re. 27,441, 7–18–72. Cl. 289—1.5.

Daal Specialties Ltd.: *See*—
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De Cecco, Angelo L., D. E. Piccone, and I. Somos, to General Electric Co. Semiconductor rectifier with improved turn-on and turn-off characteristics. Re. 27,440, 7–18–72. Cl. 317—235.

Eddy, Byron J.: *See*—
Jackson, Randolph H., Eddy, Mitchell, Johnson, Hall, and Hicks. Re. 27,439.

Fischer, Alfred, to Tenneco Chemicals, Inc. Metal salt drier compositions. Re 27,433, 7–18–72, Cl. 106—310.

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Goodyear Tire & Rubber Co., The: *See*—
Jackson, Randolph H., Eddy, Mitchell, Johnson, Hall, and Hicks. Re. 27,439.

Hall, Charles G.: *See*—
Jackson, Randolph H., Eddy, Mitchell, Johnson, Hall, and Hicks. Re. 27,439.

Hicks, James E.: *See*—
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Humphrey, Frederick H., to Daal Specialties Ltd. Buckle for a safety belt. Re. 27,438, 7–18–72, Cl. 24—230.

Jackson, Randolph H., B. J. Eddy, K. D. Mitchell, E. D. Johnson, C. G. Hall, and J. E. Hicks, to The Goodyear Tire & Rubber Co. Inclined moving walkway arrangement. Re. 27,439, 7–18–72, Cl. 198—16.

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Kyp, Robert J. Electric light bulb with oscillating filament. Re. 27,443, 7–18–72, Cl. 315—267.

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Pan American Petroleum Corp.: *See*—
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Sawyer, Bruce A. Magnetic positioning device. Re. 27,436, 7–18–72, Cl. 246—29.

Shelby, Richard K., to Monsanto Co. Molding machines. Re. 27,435, 7–18–72, Cl. 425—167.

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Vincent, Renic P., and L. B. Wilder, to Pan American Petroleum Corp. Liquid percussion motor. Re. 27,434, 7–18–72, Cl. 173—73.

Weir, Henry J., to McGraw-Edison Co. Laundry feeding machine. Re. 27,442, 7–18–72, Cl. 38—143.

Wilder, Lawrence B.: *See*—
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Will, Guenther. Process for the production of porous plastics and products. Re. 27,444, 7–18–72, Cl. 260—2.5.

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CLASSIFICATION OF PATENTS

ISSUED JULY 18, 1972

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
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CLASS 4
172.12 3,676,880

CLASS 5
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CLASS 8
4 3,677,689
10 3,677,690
41 3,677,691
120 3,677,692
127.5 3,677,693
127.6 3,677,694
152 3,677,695

CLASS 9
14 3,676,882

CLASS 12
142MC 3,676,883

CLASS 15
1.7 3,676,884
3,676,885
83 3,676,886
104.8 3,676,887
245 3,676,888
320 3,676,889
328 3,676,893
339 3,676,890
346 3,676,891
359 3,676,892
362 3,676,894

CLASS 16
110 3,676,895
150 3,676,896

CLASS 17
32 3,676,897

CLASS 23
2 3,677,696
62 3,677,697
112 3,677,698
116 3,677,699
145 3,677,700
172 3,677,701
186 3,677,703
193 3,677,702
209.1 3,677,705
209.4 3,677,704
230B 3,677,707
230R 3,677,706
232R 3,677,708
254E 3,677,709
258.5 3,677,710
267A 3,677,711
273 3,677,712
277R 3,677,713
285 3,677,714
288E 3,677,716
288S 3,677,715
294 3,677,717
301R 3,677,718
325 3,677,719
357 3,677,720

CLASS 24
73PP 3,676,898
122.6 3,676,899
126L 3,676,900
191 3,676,901
230A Re.27,438
252HC 3,676,902
265WS 3,676,904
265 3,676,903

CLASS 27
6 3,676,905

CLASS 28
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CLASS 29
1.21 3,676,907
25.16 3,676,914
110 3,676,909
116AD 3,676,908
182.2 3,677,721
182.8 3,677,722
194 3,677,723
202D 3,676,910
203H 3,676,912
203V 3,676,911
217 3,676,913
251 3,676,915
419 3,676,916
420.5 3,676,917
453 3,676,918
469 3,676,919
472.5 3,676,920
571 3,676,921
577 3,676,922
604 3,676,923
3,676,924
613 3,676,925
625 3,676,926
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3,676,929
257 3,676,930

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CLASS 33
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147L 3,676,933
169R 3,676,934
185R 3,676,935

CLASS 34
1 3,676,936
46 3,676,937

CLASS 35
35A 3,676,938
48R 3,676,939

CLASS 36
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CLASS 37
2R 3,676,941

CLASS 38
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CLASS 40
124.2 3,676,942
130M 3,676,943
155 3,676,944

CLASS 42
1G 3,676,945
50 3,676,946
79 3,676,947

CLASS 43
42.45 3,676,948
124 3,676,949

CLASS 44
62 3,677,724
3,677,725
71 3,677,726

CLASS 46
14 3,676,950
114 3,676,951

CLASS 47
33 3,676,952
38.1 3,676,953

CLASS 48
206 3,677,727

CLASS 49
141 3,676,954
192 3,676,955
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165R 3,676,959
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211 3,676,966
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223R 3,676,968
233 3,676,969
262 3,676,973
385 3,676,970
603 3,676,971
638 3,676,972
716 3,676,974
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747 3,676,976

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24 3,676,977
59R 3,676,978
112A 3,676,979
183 3,676,980

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30 3,676,981
95 3,676,982
192 3,676,983
193 3,676,984
317 3,676,985
459 3,676,987
472 3,676,986

CLASS 56
1 3,676,988
10.5 3,676,989

CLASS 57
81 3,676,990
140R 3,676,991
164 3,676,992

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23 3,676,993
68 3,676,994
76 3,676,995
90R 3,676,996
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107 3,676,998

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39.28 3,677,000
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52B 3,677,002
54 3,677,003
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54.6P 3,677,006
3,677,007
59T 3,677,008
97E 3,677,009
220 3,677,010
251 3,677,011
262 3,677,012
303 3,677,013

CLASS 61
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45R 3,677,015
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46.5 3,677,016
48 3,677,017
53.5 3,677,018

CLASS 62
9 3,677,019
10 3,677,020
55 3,677,021
56 3,677,022
58 3,677,023
64 3,677,024
81 3,677,025
115 3,677,026
3,677,027
200 3,677,028
305 3,677,029
353 3,677,030

CLASS 64
13 3,677,031
17A 3,677,032
28R 3,677,033

CLASS 65
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30 3,677,729
36 3,677,730
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133 3,677,732
268 3,677,733

CLASS 66
84 3,677,034
122 3,677,035
132R 3,677,036
147 3,677,037

CLASS 68
20 3,677,038
146 3,677,039
181R 3,677,040

CLASS 69
33 3,677,041

CLASS 70
70 3,677,042
92 3,677,043
456R 3,677,044

CLASS 71
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34 3,677,734
66 3,677,735
90 3,677,737
97 3,677,738
118 3,677,739

CLASS 72
8 3,677,045
49 3,677,046
50 3,677,047
60 3,677,048
3,677,049
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78 3,677,051
107 3,677,052
111 3,677,053
131 3,677,054
227 3,677,056
305 3,677,057
326 3,677,055
393 3,677,058
403 3,677,059
476 3,677,060

CLASS 73
1R 3,677,061
4R 3,677,062
7 3,677,063
17R 3,677,064
23 3,677,066
28 3,677,065
32 3,677,067
41 3,677,068
56 3,677,069
57 3,677,070
61.4 3,677,071
67 3,677,072
67.9 3,677,073
80 3,677,074
117.3 3,677,075
141R 3,677,078
144 3,677,076
146 3,677,077
147 3,677,079
155 3,677,080
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181 3,677,082
194EM 3,677,083
197 3,677,084
204 3,677,085
205R 3,677,086
300 3,677,087
356 3,677,088
419 3,677,089
420 3,677,090
423A 3,677,091
432A 3,677,092
473 3,677,093
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515 3,677,095

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89.2 3,677,099
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336 3,677,104
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492 3,677,106
527 3,677,096
579R 3,677,107
625 3,677,108
660 3,677,100
796 3,677,109
813L 3,677,110

CLASS 75
1 3,677,740
28 3,677,741
68B 3,677,742
84.1 3,677,743
128T 3,677,744
153 3,677,745
171 3,677,746
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CLASS 81
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CLASS 82
2.5 3,677,114
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CLASS 83
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316 3,677,119
343 3,677,120
437 3,677,121
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271 3,677,125
312 3,677,126
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422 3,677,128
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41E 3,677,134
42B 3,677,135

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6 3,677,137
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384 3,677,139
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CLASS 92
60 3,677,142
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CLASS 93
1R 3,677,144

CLASS 94
18 3,677,145

CLASS 95
1R 3,677,147
1.1 3,677,146
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4.5R 3,677,148
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10C 3,677,149
10R 3,677,150
11R 3,677,152
3,677,153
11.5R 3,677,156
3,677,157
11.5 3,677,158
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40 3,677,160
44C 3,677,155
45 3,677,161
47 3,677,162
90.5 3,677,163

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1LY 3,677,766
1R 3,677,750
3,677,751
1.6 3,677,752
29 3,677,753
35.1 3,677,754
3,677,755
36 3,677,756
36.1 3,677,757
3,677,758
48 3,677,759
50PT 3,677,760
66.5 3,677,761
74 3,677,762
82 3,677,763
100 3,677,764
124 3,677,765

CLASS 98
40DL 3,677,165
40D 3,677,164
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CLASS 99
6 3,677,767
83 3,677,768
86 3,677,769
134R 3,677,770
3,677,771
140N 3,677,773
140R 3,677,772
171B 3,677,774
174 3,677,775
234S 3,677,168
234 3,677,167
256 3,677,169
337 3,677,170
339 3,677,171
347 3,677,172
357 3,677,173
417 3,677,174

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35 3,677,175

CLASS 101
96 3,677,176
228 3,677,177
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24R 3,677,180
52 3,677,181
56 3,677,179
66 3,677,182
67 3,677,183
70.2P 3,677,184
78 3,677,185
83 3,677,186

CLASS 104
10 3,677,187
120 3,677,188
124 3,677,189
172B 3,677,190

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197D 3,677,363
248 3,677,191
368B 3,677,194
368R 3,677,192
3,677,193
369A 3,677,195
377 3,677,196
378 3,677,197
420 3,677,198

CLASS 106
1 3,677,776
15AF 3,677,777
39DV 3,677,785
47Q 3,677,778
58 3,677,779
90 3,677,780
100 3,677,781
288Q 3,677,782
292 3,677,783
309 3,677,784
310 Re.27,433

CLASS 108
55 3,677,199
58 3,677,200
3,677,201
109 3,677,202
111 3,677,203

CLASS 110
1 3,677,204

CLASS 112
2 3,677,205
79R 3,677,206
118 3,677,207
178 3,677,208
240 3,677,209
258 3,677,210

CLASS 113
121AA 3,677,211

CLASS 114
61 3,677,212

67A 3,677,213
218 3,677,214

CLASS 115

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24.1 3,677,216
31 3,677,217

CLASS 116

70 3,677,218
80 3,677,219
118 3,677,220
135 3,677,221

CLASS 117

1.7 3,677,786
2R 3,677,787
11 3,677,788
22 3,677,789
33.3 3,677,790
33.5CM 3,677,791
35V 3,677,792
38 3,677,793
45 3,677,794
46CG 3,677,795
56 3,677,802
62.1 3,677,798
70A 3,677,796
71M 3,677,797
93.1R 3,677,799
93.31 3,677,800
94 3,677,801
3,677,803
100A 3,677,804
102A 3,677,805
104R 3,677,806
105 3,677,807
105.3 3,677,808
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138.8E 3,677,811
138.8F 3,677,810
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142 3,677,813
211 3,677,814
215 3,677,815
217 3,677,816
235 3,677,817

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10 3,677,223
63 3,677,224
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415 3,677,227
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75 3,677,231
146 3,677,232
157 3,677,233

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CLASS 123

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32EA 3,677,236
32G 3,677,256
97B 3,677,237
117A 3,677,238
119DB 3,677,241
119A 3,677,239
119B 3,677,240
148E 3,677,253
3,677,254
3,677,255

CLASS 124

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23C 3,677,258

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CLASS 127

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2.06A 3,677,260
2.1Z 3,677,261
6 3,677,262
24.1 3,677,263
62A 3,677,264
80C 3,677,265
132D 3,677,266
132 3,677,225
145.8 3,677,267
172.1 3,677,268
214C 3,677,242
214.4 3,677,243
3,677,244
218G 3,677,246
218S 3,677,245
221 3,677,247
227 3,677,248
290 3,677,249
348 3,677,250
419P 3,677,251
454 3,677,252

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134 3,677,269

CLASS 132

48R 3,677,270
79 3,677,271

CLASS 134

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25A 3,677,820
42 3,677,821
93 3,677,272
127 3,677,273

CLASS 135

24 3,677,274

CLASS 136

83T 3,677,822
86C 3,677,823
175 3,677,824
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14 3,677,276
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81.5 3,677,278
197 3,677,279
270 3,677,281
283 3,677,282
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351 3,677,284
357 3,677,285
469 3,677,286
491 3,677,287
501 3,677,288
527.8 3,677,289
528 3,677,290
544 3,677,292
554 3,677,291
561 3,677,293
572 3,677,294
596.12 3,677,295
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625.28 3,677,297
625.64 3,677,298

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99 3,677,305
127P 3,677,304
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353 3,677,307

CLASS 140

93.6 3,677,308
149 3,677,309

CLASS 141

1 3,677,310
3,677,311

CLASS 143

46F 3,677,312
68F 3,677,313

CLASS 146

49B 3,677,314
224 3,677,315
242 3,677,316

CLASS 148

6.14R 3,677,827
6.15R 3,677,828
6.35 3,677,829
12.7 3,677,830
12.9 3,677,831
31.5 3,677,832
32.5 3,677,835
33.2 3,677,833
36 3,677,834
171 3,677,836
175 3,677,837
187 3,677,838

CLASS 149

19 3,677,839
3,677,840
92 3,677,841
109 3,677,842
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CLASS 150

28R 3,677,317

CLASS 152

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361 3,677,319

CLASS 156

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3 3,677,843
3,677,845
8 3,677,846
3,677,847
17 3,677,848
53 3,677,849
62.2 3,677,850
73 3,677,851
127 3,677,852
160 3,677,853
173 3,677,854
181 3,677,855
187 3,677,856
210 3,677,857
219 3,677,858
250 3,677,859
299 3,677,860
380 3,677,861
392 3,677,862
500 3,677,863
505 3,677,864
577 3,677,865
584 3,677,866

CLASS 157

1.1 3,677,320

CLASS 159

48 3,677,321

CLASS 160

135 3,677,322

CLASS 161

14 3,677,867
37 3,677,868
42 3,677,869
43 3,677,870
84 3,677,871
93 3,677,872
109 3,677,873
116 3,677,874
117 3,677,875
160 3,677,878
164 3,677,877
165 3,677,876
170 3,677,879
173 3,677,880
178 3,677,881
189 3,677,882
251 3,677,883
262 3,677,884

CLASS 162

45 3,677,885
72 3,677,886
140 3,677,887
164 3,677,888

CLASS 164

52 3,677,323
60 3,677,324
73 3,677,325
108 3,677,330
122 3,677,331
133 3,677,332
154 3,677,333

CLASS 165

1 3,677,326
3,677,327
11 3,677,334
12 3,677,335
47 3,677,328
105 3,677,329
3,677,336
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111 3,677,338
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CLASS 166

124 3,677,341
247 3,677,342
252 3,677,343
3,677,344
315 3,677,340
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CLASS 169

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CLASS 172

2 3,677,348
285 3,677,349
789 3,677,350

CLASS 173

57 3,677,351
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CLASS 174

84R 3,678,174
92 3,678,175
94R 3,678,176
113C 3,678,177
152R 3,678,178

CLASS 175

7 3,677,352
25 3,677,353
76 3,677,354
215 3,677,355

CLASS 176

3 3,677,889
5 3,677,890
36R 3,677,891
40 3,677,892
68 3,677,894
78 3,677,893

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190 3,677,356

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5.4ST 3,678,184
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5.8AF 3,678,183
6.6FS 3,678,186
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6.7R 3,678,187
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6.8 3,678,190
7.2 3,678,195
7.5D 3,678,196
7.5E 3,678,191
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69.5R 3,678,200

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100.2C 3,678,218
100.2P 3,678,211
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100.2S 3,678,220
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100.2T 3,678,214
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175.31R 3,678,222

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6.48 3,677,362
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121 3,677,359
124 3,677,360
127 3,677,361

CLASS 181

36R 3,677,364
72 3,677,365

CLASS 182

70 3,677,366
136 3,677,367
139 3,677,368

CLASS 184

1.5 3,677,369

CLASS 187

31 3,677,370

CLASS 188

1C 3,677,371
73.3 3,677,372
73.6 3,677,373
138 3,677,375
329 3,677,374
341 3,677,376

CLASS 191

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CLASS 192

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54R 3,677,378
91R 3,677,379
105BA 3,677,380
106F 3,677,381

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35A 3,677,383
35B 3,677,382

CLASS 195

28R 3,677,895
31R 3,677,896
55 3,677,897
62 3,677,898
66R 3,677,899
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3,677,902
103.5R 3,677,903
3,677,904

CLASS 197

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19 3,677,385
53 3,677,386
98 3,677,387

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33R 3,677,390
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36 3,677,392
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220DA 3,677,395

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50A 3,678,230
81R 3,678,231
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38B 3,677,908
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54R 3,677,910
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59R 3,677,914
3,677,915
3,677,916
99 3,677,917
105R 3,677,918
113 3,677,919
159.15 3,677,920
159.19 3,677,921
159.21 3,677,922
180P 3,677,923
192 3,677,924
195R 3,677,925
224 3,677,928
243R 3,677,926
258 3,677,927
286 3,677,929
299 3,677,930
312 3,677,931

CLASS 206

1R 3,677,396
42 3,677,397
45.34 3,677,398
46AM 3,677,399
75 3,677,400

CLASS 208

108 3,677,932
109 3,677,933
323 3,677,934

CLASS 209

73 3,677,401
270 3,677,402
308 3,677,403

CLASS 210

3 3,677,935
15 3,677,936
19 3,677,937
31 3,677,938
36 3,677,939
44 3,677,940
67 3,677,404
71 3,677,405
75 3,677,406
83 3,677,407
169 3,677,408
195 3,677,409
198 3,677,410
393 3,677,411
440 3,677,412
502 3,677,413

CLASS 211

13 3,677,414
59 3,677,415
148 3,677,416

CLASS 212

145 3,677,417

CLASS 214

1BV 3,677,419
1QC 3,677,418
16.4A 3,677,420
3,677,421
17D 3,677,422
18R 3,677,423
77 3,677,424
85.1 3,677,425
138R 3,677,426
140 3,677,427
147G 3,677,428

CLASS 215

11C 3,677,429
41 3,677,430
43 3,677,431

CLASS 219

10.55 3,678,238
60A 3,678,239
69D 3,678,240
72 3,678,241
118 3,678,242
301 3,678,243
388 3,678,244
396 3,678,245
437 3,678,246
501 3,678,247
525 3,678,248
544 3,678,249

CLASS 220

3 3,677,432
4R 3,677,433
59 3,677,434
60R 3,677,435
97B 3,677,436

CLASS 221

7 3,677,437
63 3,677,438
251 3,677,439
279 3,677,440

CLASS 222

23 3,677,540
63 3,677,441
70 3,677,442
94 3,677,443
135 3,677,444
153 3,677,445
177 3,677,446
193 3,677,447
387 3,677,448

CLASS 224

4E 3,677,449
3,677,450
42.1F 3,677,451

CLASS 225

11 3,677,452
93 3,677,453
99 3,677,454

CLASS 226

49 3,677,455

CLASS 227

8 3,677,456
3,677,457

CLASS 229

27 3,677,458
52A 3,677,459
85 3,677,460

CLASS 232

15 3,677,461

CLASS 235

54R 3,677,462
58CW 3,677,463
60TK 3,677,464
61L 3,677,466
61.11A 3,678,251
61.11R 3,678,250
61.7R 3,677,465
78 3,677,467
92EV 3,678,252
92FL 3,678,253
92PK 3,678,254
144PN 3,677,468
145R 3,678,255
150.2 3,678,256
150.53 3,678,258
151.34 3,678,257
156 3,678,259

CLASS 238

10E 3,677,469

CLASS 239

15 3,677,470
85 3,677,471
230 3,677,472
251 3,677,473
587 3,677,474

CLASS 240

1.2 3,678,260
52 3,678,263
84 3,678,264
3,678,265
90 3,678,266
151 3,678,261

CLASS 241

20 3,677,475
21 3,677,476
31 3,677,477
82 3,677,478
183 3,677,479

CLASS 242

1.1R 3,677,480
18R 3,677,481
3,677,482
25R 3,677,483

54R 3,677,484
55.3 3,677,485
56R 3,677,505
67.4 3,677,486
71.2 3,677,487
129.72 3,677,489
163 3,677,490
3,677,491
164 3,677,492
191 3,677,493
194 3,677,494
197 3,677,495
199 3,677,496
3,677,497
207 3,677,498
210 3,677,499

CLASS 244

1SS 3,677,508
3.13 3,677,500
12B 3,677,501
13 3,677,502
23 3,677,503
42CC 3,677,504
103R 3,677,488
137 3,677,506
3,677,507

CLASS 248

187 3,677,509
441 3,677,510
448 3,677,511

CLASS 249

48 3,677,512

CLASS 250

41.9SB 3,678,267
43.5D 3,678,268
43.5R 3,678,262
3,678,269
49.5B 3,678,270
71R 3,678,272
71.5R 3,678,271
83R 3,678,273
83.3H 3,678,276
83.3R 3,678,277
83.6R 3,678,274
3,678,275
86 3,678,233
108R 3,678,278
203 3,678,279
213A 3,678,280
216 3,678,281
3,678,283
219FR 3,678,282

CLASS 251

148 3,677,513
3,677,514
149.7 3,677,515
174 3,677,516
366 3,677,517

CLASS 252

8.1 3,677,942
8.55R 3,677,941
46.7 3,677,943
48.4 3,677,944
49.6 3,677,945
51.5A 3,677,946
62.54 3,677,947
78 3,677,948
79.4 3,677,949
79.5 3,677,950
92 3,677,951
94 3,677,952
103 3,677,953
121 3,677,954
162 3,677,955
180 3,677,956
188.3 3,677,957
301.1R 3,677,958
301.2R 3,677,959
301.4F 3,677,960
316 3,677,961
345 3,677,962
358 3,677,963
364 3,677,964
403 3,677,965
408 3,677,966
3,677,967
431N 3,677,968
431R 3,677,969
431 3,677,970
455R 3,677,971
455Z 3,677,972
3,677,973
514 3,677,974
518 3,677,975

CLASS 254

93R 3,677,518
131 3,677,519
173 3,677,520
183 3,677,521

CLASS 259

4 3,677,522
69 3,677,523
72 3,677,524

CLASS 260

2EP 3,677,978
2H 3,677,976
2.2C 3,677,979
2.5AT 3,677,983
2.5HA 3,677,980
2.5R Re.27,444
3,677,982
2.5S 3,677,981
18S 3,678,002
21 3,677,984
27R 3,677,985
29.3 3,677,986
29.6WB 3,677,990
29.6H 3,677,989
3,677,991
29.6M 3,677,987
29.6S 3,677,988
32.8N 3,677,992
33.2SB 3,677,997
33.6SB 3,677,998
33.6A 3,677,993
37EP 3,677,995
37PC 3,678,079
37R 3,677,994
38 3,677,999
45.75N 3,678,000
3,678,001
46.5G 3,677,996
3,678,003
47CP 3,678,005
47EC 3,678,004
47EN 3,678,007
47R 3,677,977
3,678,006
51.5 3,678,103
65 3,678,008
75NH 3,678,011
75NP 3,678,009
75T 3,678,010
77.5AR 3,678,012
77.5CR 3,678,014
77.5R 3,678,013
78UA 3,678,015
78.4D 3,678,016
79.5B 3,678,017
80.78 3,678,018
3,678,019
3,678,020
80.81 3,678,021
88.7 3,678,022
89.5N 3,678,098
93.7 3,678,023
94.9GA 3,678,024
94.9E 3,678,025
112.5 3,678,026
3,678,027
186 3,678,028
210.5 3,678,029
211.5R 3,678,030
231CM 3,678,031
239BD 3,678,036
239E 3,678,035
239.1 3,678,032
3,678,037
239.3B 3,678,033
239.3D 3,678,038
3,678,043
239.55 3,678,034
239.6 3,678,039
240CA 3,678,042
240A 3,678,040
3,678,041
240F 3,678,044
240.4 3,678,045
244R 3,678,046
247.2B 3,678,048
248CS 3,678,049
248NS 3,678,047
250R 3,678,050
267 3,678,051
268R 3,678,052
272 3,678,053
279R 3,678,054
290R 3,678,055
293.52 3,678,056
293.54 3,678,057
3,678,058
295.5A 3,678,060
295.5B 3,678,059
296B 3,678,062
296R 3,678,061
3,678,063
306.7 3,678,064
307F 3,678,065
309.2 3,678,066
326C 3,678,071
3,678,073
326.5B 3,678,072
327M 3,678,074
3,678,075
330.5 3,678,076
332.3P 3,678,070
335 3,678,077
348R 3,678,078
396R 3,678,080
3,678,081
397.5 3,678,082
413 3,678,083
424 3,678,084
429CY 3,678,088
429R 3,678,085
429.9 3,678,086
435R 3,678,087
448.2N 3,678,089
465.3 3,678,090
3,678,091
468R 3,678,092
3,678,093
471R 3,678,094
473S 3,678,095
482R 3,678,067
484A 3,678,069
484R 3,678,068
3,678,096
486R 3,678,097
497R 3,678,099
502.4R 3,678,100
512R 3,678,101
514R 3,678,102
521R 3,678,104
524R 3,678,105
3,678,106
531R 3,678,107
563D 3,678,108
564R 3,678,109
567.6M 3,678,110
570 3,678,111
578 3,678,112
3,678,113
580 3,678,114
603HF 3,678,139
609F 3,678,115
619F 3,678,116
619R 3,678,117
641 3,678,118
666PY 3,678,119
668A 3,678,120
668B 3,678,121
671A 3,678,122
671R 3,678,123
680E 3,678,124
827 3,678,125
3,678,126
830P 3,678,127
837R 3,678,130
3,678,131
850 3,678,128
859PV 3,678,129
876B 3,678,134
876R 3,678,132
3,678,133
889 3,678,135
897C 3,678,136
944 3,678,137

CLASS 261

1 3,677,525
23A 3,677,526
76 3,677,527
87 3,677,528
129 3,677,529

CLASS 263

3 3,677,530
6R 3,677,531
19A 3,677,532
52 3,677,533

CLASS 264

3R 3,678,138
22 3,678,141
25 3,678,142
30 3,678,143
42 3,678,144
115 3,678,145
313 3,678,146
325 3,678,147

CLASS 266

20 3,677,534

CLASS 267

63 3,677,535

CLASS 270

31 3,677,536

CLASS 271

29 3,677,537
76 3,677,538

CLASS 272

1B 3,677,539
33R 3,677,541
82 3,677,543

CLASS 273

26D 3,677,544
67A 3,677,542
102.1C 3,677,545
102.2R 3,677,546
109 3,677,547
130R 3,677,548
135R 3,677,549
137R 3,677,550
183B 3,677,551
184B 3,677,552
186A 3,677,553

CLASS 274

3 3,677,554
4B 3,677,557
4C 3,677,556
4F 3,677,555

CLASS 277

138 3,677,558

CLASS 279

1Q 3,677,559
47 3,677,560

CLASS 280

11.35C 3,677,567
11.35T 3,677,566
21R 3,677,568
32.6 3,677,569
33.99A 3,677,570
36R 3,677,571
39 3,677,572
43.1 3,677,573
43.13 3,677,574
47.19 Re.27,437
124F 3,677,561
179A 3,677,562
425R 3,677,563
457 3,677,564
499 3,677,565

CLASS 285

3 3,677,575
43 3,677,576
137R 3,677,577
162 3,677,578
169 3,677,579
184 3,677,580
292 3,677,581

CLASS 287

49 3,677,582
3,677,584
52.06 3,677,583
87 3,677,585
3,677,586
3,677,587
189.36A 3,677,589
189.36F 3,677,588

CLASS 289

1.5 Re.27,441

CLASS 290

1 3,678,284
40 3,678,285

CLASS 291

3 3,677,590

CLASS 292

221 3,677,591
288 3,677,592
356 3,677,593

CLASS 293

67 3,677,594
73 3,677,595

CLASS 294

19R 3,677,597
19 3,677,596
64R 3,677,598
67DA 3,677,599

CLASS 296

27 3,677,600

CLASS 297

441 3,677,601

CLASS 299

31 3,677,602
3,677,603
67 3,677,604

CLASS 303

6C 3,677,605
3,677,606
10 3,677,607
21BE 3,677,609
21F 3,677,608
3,677,610
84A 3,677,611

CLASS 307

38 3,678,286
88LC 3,678,287
113 3,678,288
149 3,678,289
202 3,678,291
205 3,678,290
207 3,678,292
214 3,678,293
230 3,678,294
231 3,678,296
235 3,678,295
251 3,678,297
270 3,678,298
275 3,678,299
288 3,678,300
289 3,678,301
299 3,678,302

CLASS 308

5 3,677,612
135 3,677,613

CLASS 310

3R 3,678,303
8 3,678,304
8.1 3,678,305
8.5 3,678,309
11 3,678,306
22 3,678,307
36 3,678,308
40MM 3,678,310
156 3,678,311
185 3,678,312
236 3,678,313
268 3,678,314

CLASS 312

108 3,677,614
346 3,677,615

CLASS 313

27 3,678,315
69C 3,678,316
69R 3,678,317
70C 3,678,318
3,678,320
78 3,678,321
201 3,678,322
231 3,678,323
236 3,678,324
271 3,678,319
346 3,678,325

CLASS 315

3.6 3,678,326
5.39 3,678,327
12 3,678,328
13R 3,678,329
3,678,330
27TD 3,678,331
27R 3,678,332
31 3,678,333
111 3,678,334
267 Re.27,443

CLASS 317

3 3,678,336
4 3,678,337
11A 3,678,335
18R 3,678,338
58 3,678,339
61 3,678,340
61.5 3,678,341
100 3,678,342
3,678,343
137 3,678,344
230 3,678,345
234R 3,678,346
235R 3,677,280
3,678,347
235 Re.27,440
3,678,348
243 3,678,349
262A 3,678,350

CLASS 318

61 3,678,351
138 3,678,352
203R 3,678,355
211 3,678,353
245 3,678,357
254 3,678,358
3,678,359
294 3,678,354
332 3,678,360
341 3,678,356
473 3,678,361

CLASS 320

1 3,678,362
24 3,678,363

CLASS 321

7 3,678,367
8R 3,678,365
3,678,366
11 3,678,368
69R 3,678,369

CLASS 323

4 3,678,370
6 3,678,371
45 3,678,372
75N 3,678,373
90 3,678,374

CLASS 324

29 3,678,375
54 3,678,376
55 3,678,377
61R 3,678,378
73 3,678,379
83A 3,678,380
95 3,678,381
140R 3,678,382
154R 3,678,383
158F 3,678,385
158R 3,678,384
174 3,678,386

CLASS 325

4 3,678,387
3,678,388
38R 3,678,389
46 3,678,390
55 3,678,391
392 3,678,392
410 3,678,393
423 3,678,394
3,678,397
446 3,678,395
474 3,678,396

CLASS 328

48 3,678,398
134 3,678,399

CLASS 329

117 3,678,364

CLASS 330

4 3,678,400
5.5 3,678,401
9 3,678,402
13 3,678,403
22 3,678,404
26 3,678,405
29 3,678,406
35 3,678,407
207P 3,678,408

CLASS 331

94.5 3,678,409
3,678,410
3,678,411
112 3,678,412

CLASS 332

9R 3,678,413

CLASS 333

7 3,678,414
9 3,678,415
17 3,678,416
22R 3,678,417
26 3,678,418
70S 3,678,419
73S 3,678,433
95R 3,678,420

CLASS 334

15 3,678,421

CLASS 335

112 3,678,422
154 3,678,423
206 3,678,424
207 3,678,425
234 3,678,426
284 3,678,436
304 3,678,427

CLASS 336

84 3,678,428
170 3,678,429

CLASS 337

159 3,678,430
185 3,678,431
201 3,678,432

CLASS 338

196 3,678,434
263 3,678,435

CLASS 339

18C 3,678,437
29B 3,678,438
46 3,678,439
61R 3,678,440
94R 3,678,441
111 3,678,442
119L 3,678,443
130C 3,678,444
143R 3,678,445
177E 3,678,446
3,678,447
217S 3,678,448
225 3,678,449
226 3,678,450
258R 3,678,451

CLASS 340

3R 3,678,452
15 3,678,453
15.5R 3,678,454
63 3,678,455
87 3,678,456
107 3,678,457
3,678,458
166R 3,678,459
167R 3,678,460
172.5 3,678,461
3,678,462
3,678,463
3,678,464
3,678,465
3,678,466
3,678,467
3,678,468
3,678,469
3,678,470
3,678,471
3,678,483
173CA 3,678,473
173LT 3,678,472
173SP 3,678,476
173R 3,678,474
3,678,477
174SP 3,678,475

174TF 3,678,478
3,678,479
174.1C 3,678,481
174.1E 3,678,480
3,678,482
174.1H 3,678,484
177R 3,678,485
227 3,678,486
236 3,678,487
3,678,488
237R 3,678,489
244E 3,678,490
253C 3,678,491
258B 3,678,492
269 3,678,493
279 3,678,494
323 3,678,495
3,678,496
324A 3,678,497
3,678,498
336 3,678,499
347AD 3,678,500
3,678,501
3,678,505
347DA 3,678,504
347DD 3,678,503

3,678,507
347NT 3,678,502
3,678,506
392 3,678,508
408 3,678,512
409 3,678,509
410 3,678,510
414 3,678,513
420 3,678,511

CLASS 346

29 Re.27,436

CLASS 350

3.5 3,677,616
3,677,617
16 3,677,618
110 3,677,619
145 3,677,620
157 3,677,621
163 3,677,622
321 3,677,623

CLASS 352

73 3,677,624
91 3,677,625
109 3,677,626

3,677,627
128 3,677,628
225 3,677,629

CLASS 353

15 3,677,630
83 3,677,631

CLASS 355

2 3,677,634
3 3,677,632
7 3,677,633
11 3,677,635
18 3,677,636
45 3,677,637
74 3,677,638
76 3,677,639
78 3,677,640
83 3,677,641
91 3,677,643
96 3,677,644

CLASS 356

2 3,677,645
4 3,677,646
28 3,677,647
40 3,677,648
74 3,677,649

85 3,677,642
103 3,677,650
126 3,677,651
183 3,677,652
256 3,677,653

CLASS 401

63 3,677,654

CLASS 408

1 3,677,655
76 3,677,656
241G 3,677,657

CLASS 415

108 3,677,658
111 3,677,659
172 3,677,660
199 3,677,661

CLASS 416

183 3,677,662
3,677,663

CLASS 417

310 3,677,664
410 3,677,665
424 3,677,666

474 3,677,667

CLASS 418

45 3,677,668

CLASS 424

1 3,678,148
3 3,678,151
5 3,678,152
8 3,678,149
12 3,678,150
52 3,678,153
3,678,154
3,678,155
68 3,678,156
71 3,678,157
94 3,678,158
116 3,678,159
117 3,678,160
122 3,678,161
180 3,678,162
203 3,678,163
204 3,678,164
211 3,678,165

246 3,678,166
248 3,678,167
250 3,678,168
263 3,678,169
283 3,678,170
300 3,678,171
306 3,678,172
329 3,678,173

CLASS 425

6 3,677,669
62 3,677,670
78 3,677,671
3,677,672
3,677,673
3,677,674
107 3,677,675
109 3,677,676
3,677,677
119 3,677,678
3,677,679
129 3,677,680
145 3,677,681
167 Re.27,435
192 3,677,682
314 3,677,683
393 3,677,684
450 3,677,685
452 3,677,686
457 3,677,687
468 3,677,688

CLASSIFICATION OF DESIGNS

D 2— 232 224,281
234 224,282
408 224,283
D 5— 2 224,284
D 6— 71 224,285
D 9— 116 224,286
157 224,287
185 224,288
187 224,289
191 224,290
216 224,291
D13— 1 224,292
224,293
224,294
224,295
224,296
224,297

D14— 3 224,298
6 224,299
224,300
24 224,301
D23— 4 224,304
17 224,305
43 224,303
52 224,306
55 224,302
58 224,307
224,308
127 224,310
150 224,311
D24— 1 224,312
D26— 224,318
224,319
5 224,314

224,320
224,321
224,352
14 224,313
224,315
224,316
224,317
224,322
224,323
D33— 224,324
D34— 2 224,325
5 224,326
224,327
224,328
224,329
224,330
15 224,331

224,332
D35— 3 224,333
D44— 1 224,334
224,335
9 224,336
29 224,337
D48— 20 224,338
27 224,339
77 224,309
D52— 2 224,340
7 224,341
D54— 1 224,342
12 224,343
224,344
224,345
D56— 4 224,346
D57— 1 224,347

224,348
224,349
D61— 224,350
224,351
D64— 10 224,353
D65— 1 224,354
224,355
224,356
224,357
224,358
224,359
224,360
D71— 224,361
224,362
224,363
D83— 224,364

D86— 10 224,365
D87— 1 224,366
224,367
224,368
224,369
3 224,370
224,371
D88— 1 224,372
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3,677,839	3,677,288	3,677,795	3,678,440	3,678,357	3,677,290
3,677,867	3,677,298	3,677,841	3,678,441	10 : 3,676,902	3,677,322
3,678,088	3,677,302	3,677,875	3,678,445	3,677,530	3,677,331
3,678,249	3,677,308	3,677,889	3,678,450	3,677,802	3,677,348
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3,676,934	3,677,437	3,678,006	3,678,493	3,677,284	3,677,431
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3,676,954	3,677,469	3,678,130	8 : 3,677,067	3,677,379	3,677,456
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3,676,989	3,677,474	3,678,174	3,678,313	3,677,424	3,677,461
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3,677,008	3,677,494	3,678,191	9 : 3,676,881	3,677,529	3,677,495
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